

156 FERC ¶ 62,122
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Duke Energy Carolinas, LLC

Project No. 2503-154

ORDER ISSUING NEW LICENSE

(Issued August 16, 2016)

INTRODUCTION

1. On August 27, 2014, Duke Energy Carolinas, LLC (Duke Energy) filed, pursuant to sections 4(e) and 15 of the Federal Power Act (FPA),¹ an application for a new license to continue operation and maintenance of its Keowee-Toxaway Hydroelectric Project No. 2503 (Keowee-Toxaway Project or project). The project consists of two developments: the Jocassee Development and the Keowee Development. The project's authorized capacity being licensed is 867.6 megawatts (MW). The project is located on the Toxaway, Keowee, and Little Rivers in Transylvania County, North Carolina, and Oconee and Pickens Counties, South Carolina.² The project does not occupy federal land.

2. As discussed below, this order issues a new license for the project.

BACKGROUND

3. On September 26, 1966, the Federal Power Commission, predecessor to the Federal Energy Regulatory Commission (Commission), issued the original 50-year license for the Keowee-Toxaway Project, which will expire on August 31, 2016.³

¹ 16 U.S.C. §§ 797(e) and 808 (2012).

² The Keowee-Toxaway Project is located on the Toxaway, Keowee, and Little Rivers, tributaries of the Savannah River, a navigable waterway of the United States. 8th Annual Report of the Federal Power Commission, 100 (1928). Tributaries of navigable waterways are Commerce Clause streams within the meaning of section 23(b)(1) of the FPA. Because the project is located on a stream over which Congress has jurisdiction under the Commerce Clause, affects interstate commerce through its connection to an interstate power grid, and was constructed after 1935, it is required to be licensed by the Commission pursuant to section 23(b)(1) of the FPA. *See* 16 U.S.C. § 817(1)(2012).

³ *Duke Power Co.*, 36 F.P.C. 675 (1966) (issuing an original 50-year license (continued ...))

4. With its relicensing application, on August 27, 2014, Duke Energy filed a Relicensing Agreement, adopting its terms as the relicensing proposal. The Relicensing Agreement, which was signed by Duke Energy and 16 other entities,⁴ included operating provisions later incorporated into the Operating Agreement between the U.S. Army Corps of Engineers (Corps), the Southeastern Power Administration (SEPA), and Duke Energy, which was executed on October 17, 2014.

5. On February 5, 2015, the Commission issued a public notice that was published in the *Federal Register* accepting the application for filing, indicating the application was ready for environmental analysis, and establishing an April 6, 2015, deadline for filing motions to intervene and protests, comments, recommendations, terms and conditions, and prescriptions.⁵ The notice also solicited comments on the Relicensing Agreement. The U.S. Department of the Interior (Interior), National Marine Fisheries Service (NMFS), North Carolina Department of Environment and Natural Resources (North Carolina DENR),⁶ and South Carolina DNR filed notices of intervention.⁷ None of the intervenors oppose the project. Interior, the U.S. Fish and Wildlife Service (FWS), South Carolina Department of Natural Resources (South Carolina DNR), South Carolina Department of Parks, Recreation, and Tourism (South Carolina Parks), South Carolina Wildlife Federation, Commissioners of Public Works of the City of Greenville, South Carolina (Greenville Water), Oconee County Administration, Advocates for Quality

effective September 1, 1966).

⁴ These entities include: Advocates for Quality Development, Inc.; Anderson Area Chamber of Commerce, City of Seneca, South Carolina; Commissioners of Public Works of the City of Greenville, South Carolina; Friends of Lake Keowee Society, Inc.; Oconee County, South Carolina; Pickens County, South Carolina; Pickens County Water Authority; South Carolina Department of Archives and History; South Carolina Department of Natural Resources; South Carolina Department of Parks, Recreation, and Tourism; South Carolina Wildlife Federation; The Cliffs at Keowee Vineyards Community Association, Inc.; The Reserve at Lake Keowee; Upstate Forever; and Warpath Development, Inc.

⁵ 80 *Fed. Reg.* 7855 (February 12, 2015).

⁶ North Carolina DENR's name was changed to the North Carolina Department of Environmental Quality in 2015.

⁷ Under Rule 214(a)(2) of the Commission's Rules of Practice and Procedure, Interior, NMFS, North Carolina DENR, and South Carolina DNR became parties to the proceeding upon the timely filing of their notices of intervention. 18 C.F.R. § 385.214(a)(2) (2015).

Development, Inc., Friends of Lake Keowee Society, Inc. (FOLKS), Upstate Forever, Warpath Development, Inc., Congressman Jeff Duncan, Mr. Ronald E. Davis, Mr. James Vaughan, and Mr. Douglas Barker on behalf of 1,286 individuals who signed a petition (jointly, Petitioners) filed comments on the Relicensing Agreement and comments and recommendations on the application. Duke Energy filed reply comments on May 21, 2015.

6. Commission staff issued a draft Environmental Assessment (EA) on October 1, 2015, analyzing the effects of the proposed project and alternatives to it. Comments on the draft EA were filed by: Duke Energy; FWS; South Carolina DNR; Oconee County, South Carolina (Oconee County Administration); Advocates for Quality Development, Inc.; FOLKS; and Upstate Forever. On March 28, 2016, Commission staff issued a final EA.⁸

7. The interventions, comments, and recommendations have been fully considered in determining whether, and under what conditions, to issue this license.

PROJECT DESCRIPTION

A. Project Area

8. The Savannah River Basin drainage encompasses approximately 10,577 square miles, the majority of which is in South Carolina and Georgia. The Keowee-Toxaway Project lies in the upper Savannah River Basin on the Toxaway, Keowee, and Little Rivers in Transylvania County, North Carolina, and Pickens and Oconee Counties, South Carolina.⁹ The confluence of the Toxaway and Whitewater Rivers forms the Keowee River which is inundated by Lake Jocassee. The Keowee and Little Rivers join downstream of the project to form the Seneca River, which is inundated by the Corps' Hartwell Lake. The Seneca River then joins 12-mile Creek to form the Savannah River, which flows southeasterly from Hartwell Lake to the Atlantic Ocean.

9. The two project developments are, from upstream to downstream, the 710.1-MW Jocassee Development on the Keowee River at river mile (RM) 366.5 and the 157.5-MW Keowee Development on the Keowee River at RM 328.8. Downstream of Lake Keowee, the Corps operates three developments on the Savannah River. From upstream to downstream, the developments are: Hartwell Lake and Dam at RM 289; Russell Lake

⁸ Unless otherwise specified, references in this order to the EA are to the final EA.

⁹ See EA at 31. Only small portions of the extreme upper ends of Jocassee Lake are in North Carolina. The rest of the project is located in South Carolina.

and Dam at RM 259; and J. Strom Thurmond Lake and Dam at RM 222. Thurmond Dam is the last major dam on the Savannah River as it flows to the Atlantic Ocean.¹⁰

B. Project Facilities

1. Jocassee Development

10. The Jocassee Development is a pumped storage facility that includes Jocassee Dam and reservoir (Lake Jocassee). Lake Jocassee, which serves as the pumped storage facility's upper reservoir, was formed by construction of Jocassee Dam, which impounds the Keowee River just downstream of the confluence of the Whitewater and Toxaway Rivers. Lake Jocassee has a shoreline length of 92.4 miles and a surface area of 7,980 acres at full pool elevation of 1,110 feet.¹¹ The usable storage capacity is 225,387 acre-feet between elevations 1,110 and 1,080 feet.

11. Jocassee Dam is a 385-foot-high, 1,800-foot-long, earth and rock-fill dam. Two cylindrical concrete/steel intake structures, located in Lake Jocassee at the north section of the dam, lead to two power tunnels that bifurcate and pass flows to four turbines in the powerhouse. The cylindrical intake structures have eight screened water intakes positioned between elevations 1,043 and 1,067 feet. Two earthfill saddle dikes, located on the western shore of Lake Jocassee, serve to contain Lake Jocassee.

12. The Jocassee powerhouse is located at the east toe of Jocassee Dam and is situated mostly underground. The powerhouse contains four reversible pump-turbine units, each with an authorized installed capacity of 177.525 MW. The total authorized installed capacity of the powerhouse is 710.1 MW. The maximum hydraulic capacity of the units is 36,200 cubic feet per second (cfs), and the maximum pumping rate is 31,720 cfs. Flows pass from the powerhouse into a 200-foot-long tailrace section that empties directly into Lake Keowee. Power generated by each turbine passes through a step-up transformer located at the powerhouse.

13. Lake Jocassee also serves as the lower reservoir for Duke Energy's Bad Creek Pumped Storage Hydroelectric Project No. 2470 (Bad Creek Project).

2. Keowee Development

14. The Keowee Development includes Keowee Dam, Little River Dam, four saddle dikes, the Oconee Nuclear Station intake dike, Lake Keowee, a gated spillway, the Keowee powerhouse, an excavated tailrace, and an intake structure. Keowee Dam is

¹⁰ See EA at 33.

¹¹ All elevations are feet above mean sea level (AMSL) unless otherwise noted.

located about 12 miles downstream of Jocassee Dam. Duke Energy's Oconee Nuclear Station is located on the shores of Lake Keowee immediately west of Keowee Dam.

15. Lake Keowee was formed by the construction of the Keowee and Little River Dams, which impound the Keowee and Little Rivers, respectively. A 2,000-foot-long by 100-foot-deep excavated canal, located a half mile north of the Oconee Nuclear Station, connects the impounded waters of the Keowee and Little Rivers to form Lake Keowee. Lake Keowee has a surface area of 17,660 acres, and 388 miles of shoreline at a full pond elevation of 800 feet. The gross storage capacity of the lake at full pond is 869,338 acre-feet. Usable storage capacity is 364,884 acre-feet between elevations 775 and 800 feet; however, drawdowns are limited to 794.6 feet due to operating constraints at the Oconee Nuclear Station. This results in an operating range of 5.4 feet and a storage capacity of 90,319 acre-feet.

16. Keowee Dam is a 165-foot-high by 3,500-foot-long earthfill dam located on the Keowee River at RM 328.8. One cylindrical concrete/steel intake structure, located in Lake Keowee at the east section of the dam, leads to a power tunnel that bifurcates and passes flows to two turbines in the powerhouse. The cylindrical intake has eight screened water intakes positioned at different elevations in the reservoir.

17. The Little River Dam is a 1,800-foot-long, 165-foot-high earthfill dam located on the Little River at RM 3. The dam has no gates or water release structures. Four earthfill saddle dikes, located 1.5 miles north of Little River Dam on the eastern edge of Lake Keowee, serve to contain Lake Keowee.

18. The Oconee Nuclear Station intake dike is an earthfill dike located approximately three-fourths of a mile southwest of Keowee Dam in the intake channel for the Oconee Nuclear Station. The 1,200-foot-long dike has a top elevation of 825 feet, and serves to impound Lake Keowee within the intake channel. The dike has no gates or water release structures.

19. A 176-foot-wide concrete gated spillway is located at the east end of Keowee Dam. The spillway includes an entrance channel with concrete wingwalls and concrete side walls, and four Tainter gates capable of releasing up to 106,000 cfs. Flows from the Tainter gates pass into a concrete channel that empties into Hartwell Lake.

20. A powerhouse is located at the base of Keowee Dam. The powerhouse contains two Francis turbine/generator units, each with an authorized installed capacity of 78.75 MW. The total authorized installed capacity of the powerhouse is 157.5 MW. The maximum combined hydraulic capacity of the units is 24,920 cfs. Flows pass from the powerhouse into a 200-foot-long tailrace section that empties into the Corps' Hartwell Lake. Power generated by each turbine passes through a step-up transformer, located at the powerhouse.

C. Project Recreation Facilities

21. Under the current license, Duke Energy owns and leases to the South Carolina Parks one developed recreation site at Lake Jocassee. This site, Devils Fork State Park, has 7 boat ramps, 2 picnic areas, hiking trails, and a campground with 84 sites. Double Spring Campground, a geographically separate section of Devils Fork State Park also owned by Duke Energy and leased by South Carolina, provides 20 additional camping sites. Duke Energy also owns and maintains three undeveloped project recreation sites at Lake Jocassee: the Bootleg, Grindstone, and Handpole Ridge Access Areas.

22. At Lake Keowee, Duke Energy owns, operates, and maintains, or provides for the maintenance of 10 developed project recreation sites, including the Crow Creek Access Area and the World of Energy Picnic Area, which are currently located outside of the project boundary but included in the existing Commission-approved Recreation Management Plan (Recreation Plan) for the project.¹² These recreation sites provide recreation opportunities that include boating, fishing, wildlife and scenic viewing, swimming, and recreational vehicle and tent camping.

D. Project Boundary

23. The existing project boundary encompasses 28,044 acres, including Lake Jocassee and Lake Keowee, project infrastructure, and all but two of the project recreation sites (Crow Creek Access Area and World of Energy Picnic Area). Except for areas occupied by project facilities and project recreation sites, the project boundary generally follows the 1,110- to 1,120-foot contour elevation around Lake Jocassee, and the 800- to 810-foot contour elevation around Lake Keowee.

24. Under the Relicensing Agreement, Duke Energy will modify the project boundary by incorporating 55 acres associated with the existing Crow Creek Access Area, 27 acres associated with the proposed High Falls II Access Area, 10 acres associated with the proposed Mosquito Point Access Area, and 25 acres associated with expansion of the existing Double Springs Campground at Devils Fork State Park. Duke Energy also will modify the project boundary to include lands necessary to support maintenance of Saddle Dike #1 at Lake Jocassee and the dam and spillway channel at Lake Keowee, and to correct previous mapping errors identified during the relicensing process.

25. With Duke Energy's proposed modifications, the total land within the project boundary would increase by 121 acres, to 28,165 acres. Duke Energy owns all of the land proposed for inclusion in the project boundary.

¹² *Duke Energy Carolinas, LLC* 132 FERC ¶ 62,045 (2010).

E. Current Project Operation

1. Jocassee Development

26. The Jocassee Development is operated as a pumped storage facility, with the pump-turbine units used for generating power during peak demand periods (typically during the day), and for pumping water back through the power tunnels into Lake Jocassee (typically during the night). The average annual energy production from the Jocassee Development is 953,715 megawatt-hours per year (MWh/year). The average annual pumping energy used at the Jocassee Development is 1,076,966 MWh/year. The Jocassee Development is operated remotely from Duke's Hydro Operating Center in Charlotte, North Carolina.

27. Lake Jocassee is licensed to operate between 1,080 and 1,110 feet; however, the normal operating range, when not in drought conditions, has typically been far less. Lake Jocassee has operated at or above 1,094 feet more than 80 percent of the time. Daily fluctuations in the reservoir have ranged from 1.5 to 2.9 feet. The reservoir level is typically maintained by passing flows through one or more of the four turbine/pump units. During extreme flood events, when the reservoir elevation cannot be maintained using generation flows, the Tainter gates on the emergency spillway can be partially or fully opened. The emergency spillway, which has a capacity of 20,000 cfs, has not been used during the history of the project.

2. Keowee Development

28. The Keowee Development is a conventional hydropower facility, operated manually by staff on site. Average annual energy production from the Keowee Development is 64,543 MWh. Energy generated from the Keowee Development provides energy to the grid and standby emergency power for the 2,538-MW Oconee Nuclear Station located adjacent to Keowee Hydro Station. Lake Keowee provides cooling water to the Oconee Nuclear Station, and municipal water to the cities of Seneca and Greenville, South Carolina.

29. Lake Keowee is licensed to operate between elevations of 775 and 800 feet. However, based on Nuclear Regulatory Commission requirements for the Oconee Nuclear Station and other agreements, Duke Energy typically operates Lake Keowee between elevations 794.6 and 799.5 feet. On a daily average basis, Lake Keowee fluctuates less than 1 foot, rarely exceeding a fluctuation of 1.8 feet during high energy demand periods. Gross storage is 869,338 acre-feet and usable storage is 90,319 acre-feet.

30. During extremely low flow periods Duke Energy operates the project under a Low Inflow Protocol (LIP). For maintenance or emergency situations, Duke Energy operates

under a Maintenance and Emergency Protocol (MEP). Both plans are incorporated into the Operating Agreement signed by the Corps, SEPA, and Duke Energy.¹³

31. During high inflow events, Duke Energy uses the two generating units at the Keowee Development to pass inflow. The maximum hydraulic capacity of the Keowee powerhouse is 24,920 cfs. When inflow exceeds this amount, Duke Energy partially or fully opens the Tainter gates on the spillway to maintain the reservoir elevation.

F. Proposed Project Operation and Environmental Measures

32. Duke Energy proposes to operate and maintain the project in accordance with the Relicensing Agreement, which is summarized below. The Relicensing Agreement also includes measures that are not intended to be incorporated into the new license.

1. Reservoir Levels

33. Duke Energy will continue to operate Lake Jocassee within the existing upper elevation of 1,110 feet and lower elevation of 1,080 feet. For periods of normal inflow, when neither the proposed LIP nor proposed MEP is being implemented, Duke Energy will operate Lake Jocassee at a normal minimum elevation of 1,096 feet.

34. Duke Energy will operate Lake Keowee at the existing upper elevation of 800 feet. The lower elevation will be increased from 775 feet to 790 feet. The 790-foot elevation limit will be implemented by December 1, 2019, to allow time for the Oconee Nuclear Station to be modified to allow for project operations at that level.¹⁴ The interim low-level elevation for Lake Keowee will be 794.6 feet, which Duke Energy currently maintains. For periods of normal inflow, when neither the LIP nor MEP has been implemented, Duke Energy will operate at a normal minimum elevation of 796 feet.

2. Low Inflow Protocol (LIP)

35. Duke Energy will implement the LIP¹⁵ at both the Jocassee and Keowee Developments (*see* Appendix D of the Relicensing Agreement, attached as Appendix B

¹³ Duke Energy began implementing the LIP and MEP on December 1, 2013, which is the effective date of the executed Relicensing Agreement.

¹⁴ The proposed operation will require the Oconee Nuclear Station to be modified to withdraw water from Lake Keowee at the lower elevation of 790 feet.

¹⁵ The LIP sets forth a formal set of procedures for operating the project during droughts based on reservoir storage and watershed inflow triggers that advance through four stages of conservation and management as the duration and severity of drought conditions increases. The LIP establishes the Keowee-Toxaway Drought Management (*continued ...*)

of this order). The LIP is a set of procedures for operating the project during droughts based on weather and watershed inflow triggers that advance through five stages of conservation and management as the duration and severity of a drought condition increases. The LIP limits weekly flow releases from Keowee Dam to amounts specified by the applicable LIP stage in effect. The LIP allows Duke Energy to draw its lakes below the normal minimum elevations during low inflow or drought periods. Under the most severe drought conditions, Lake Jocassee will be maintained at a minimum elevation of 1,080 feet, and Lake Keowee will be maintained at a minimum elevation of 790 feet.

3. Maintenance Emergency Protocol (MEP)

36. Duke Energy will implement the MEP at both the Jocassee and Keowee Developments (see Appendix E of the Relicensing Agreement, attached as Appendix C of this order). Circumstances under which the MEP will be in effect include hydro unit outages, dam safety emergencies, maintenance activities, and flood events. Under normal operation, Lake Jocassee will be maintained between 1,106 and 1,110 feet, using the four development turbines. The MEP provides that during flood conditions, if turbine flow fails to manage reservoir elevations, Duke Energy will either partially or fully open one or both Tainter gates at Jocassee Dam to balance inflow. Similarly, if the reservoir elevation of Lake Keowee cannot be maintained with turbine flow alone, Duke Energy will open the spillway gates at Keowee Dam to match inflow. The MEP lists the parties that will be notified and/or consulted under such conditions, and provides guidelines on how to do so.

4. Water Quality

37. Duke Energy will continuously monitor dissolved oxygen (DO) concentrations in the tailwaters of the Jocassee and Keowee Developments during August for the term of the new license to demonstrate compliance with South Carolina's water quality standards. Duke Energy will submit the monitoring results to the South Carolina Department of Health and Environmental Control (South Carolina DHEC) and the Commission annually.

5. Species Protection Agreements

38. Currently, no federally listed threatened or endangered species are known to occur within the project boundary or to be affected by the project. However, Duke Energy does

Advisory Group. The Advisory Group and the activities of the group are elements of the LIP that would not be enforceable by the Commission because the Commission cannot enforce the provisions of a settlement against parties it does not regulate. *See, e.g., Avista Corporation*, 93 FERC ¶ 61,116 at 61,329 (2000).

propose restrictive land use classifications and vegetation management provisions within its Shoreline Management Plan (SMP) to limit effects on any potentially-occurring federally listed species within the project's area of influence. Duke Energy also proposes to develop and implement species protection plans to protect federally listed threatened or endangered species if and when such species are identified within the project's area of influence during the new license term. Therefore, at this time, Duke Energy has not prepared any species protection plans for federally listed species.

6. Recreation Management

39. Duke Energy will implement the Recreation Management Plan (recreation plan), filed with its license application,¹⁶ that describes operational and enhancement measures to be implemented at project recreation sites at Lake Jocassee and Lake Keowee. These measures are summarized below.

40. To enhance recreational opportunities and meet the needs of new user types at the Jocassee Development, the recreation plan includes proposals to add diver access, a new courtesy dock, a new boat and trailered parking area, access for non-motorized boating, and bank fishing signage at Devils Fork State Park. Duke Energy will also expand the project boundary at Double Springs Campground by approximately 25 acres and construct 12 new campsites and restroom facilities.

41. To enhance recreational opportunities at the Keowee Development, the recreation plan includes proposals to: (1) add bank fishing signs at all existing project recreation sites; (2) construct new parking areas at 3 recreation sites; (3) construct new trails at 2 recreation sites; (4) construct new camping facilities with 10 primitive campsites, 5 bank fishing stations, and 10 camping cabins at Mile Creek County Park; and (5) construct a canoe/kayak launch, fishing pier, and portage at 15-Acre Lake, a project recreation site located at Keowee-Toxaway State Park. The recreation plan also identifies 2 areas, the 37-acre High Falls II Access Area and the 10-acre Mosquito Point Access Area, which will be reserved for future public recreation. Duke Energy will also stabilize eroding shorelines at 3 project recreation sites: Fall Creek, High Falls II, and Mosquito Point Access Areas.

42. The recreation plan also includes a provision for Duke Energy to consult with South Carolina Parks and South Carolina DNR every 12 years on a plan to conduct a Recreation Use and Needs Study and update the recreation plan, as necessary.¹⁷

¹⁶ The recreation plan was filed as Appendix E4 of the license application.

¹⁷ The Relicensing Agreement also requires Duke Energy to revise the RMP no later than December 31, 2033.

7. Shoreline Management

43. Duke Energy will implement the SMP filed with its license application,¹⁸ which includes: (1) shoreline classification maps; (2) lake use restrictions for each shoreline classification type based on existing uses, environmental criteria, and potential future uses; and (3) shoreline management guidelines that address permitting requirements for non-project use of project lands and waters.

44. Duke Energy also will consult with FWS, South Carolina Parks, and South Carolina DNR to review and revise the SMP 10 years following license issuance, and every 10 years thereafter.

8. Historic Properties Management

45. Duke Energy proposes to implement an Historic Properties Management Plan (HPMP) to protect cultural resources at the project.

SUMMARY OF LICENSE REQUIREMENTS

46. Except as indicated below, this license requires the Duke Energy-proposed operational and environmental measures discussed above to protect and enhance water quality, fish, wildlife, recreation, and cultural resources at the project.

47. To enhance public use of the reservoirs and address the potential overuse of existing recreation sites, the license requires Duke Energy to revise the recreation plan to provide for construction of recreation amenities at Crow Creek Access Area and Mile Creek County Park; include monitoring provisions for capacity and condition of Warpath Access Area; identify the existing World of Energy Picnic Area as a project recreation site; and provide for the stabilization of 6,250 feet of shoreline on certain islands in Lake Keowee to protect the use of the islands for day-use recreation. The license also requires that all proposed improvements made to project recreation sites through Duke Energy's Access Area Improvement Initiative (AII)¹⁹ be identified in the recreation plan.

48. To address the potential effects of lowering reservoir elevations at Lake Keowee during extremely low inflow conditions on shoreline residents' ability to use their boat docks, the license requires Duke Energy to modify its proposed SMP to extend the

¹⁸ The SMP was filed as Appendix E5 of the license application.

¹⁹ The AII is a program established by Duke Energy to provide opportunities for tribes, state and local governments, and businesses to lease project recreation sites for operating and maintaining new and existing public recreation facilities.

provision for exemptions to the maximum size limit for private facilities (e.g., boat docks) from the time of license issuance through December 31, 2020.

49. To protect cultural resources, the license requires Duke Energy to implement the HPMP filed on November 5, 2014, pursuant to a Programmatic Agreement (PA) that was executed on May 8, 2015, by the North Carolina State Historic Preservation Officer (SHPO) and on May 19, 2015, by the South Carolina SHPO.²⁰

WATER QUALITY CERTIFICATION

50. Under section 401(a)(1) of the Clean Water Act (CWA),²¹ the Commission may not issue a license authorizing the construction or operation of a hydroelectric project unless the state water quality certifying agency has either issued water quality certification for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed 1 year. Section 401(d) of the CWA provides that the certification shall become a condition of any federal license that authorizes construction or operation of the project.²²

A. North Carolina

51. Only a small portion of the upper end of Lake Jocassee is located in North Carolina. Because no project releases occur in North Carolina, water quality certification from that state is not required.²³

B. South Carolina

52. On March 31, 2015, Duke Energy filed an application with South Carolina DHEC for certification pursuant to the CWA for the Keowee-Toxaway Project, which South Carolina DHEC received on April 1, 2015. On October 29, 2015, South Carolina DHEC issued a certification for the Keowee-Toxaway Project that includes the conditions set

²⁰ Commission staff found Duke Energy's proposed HPMP needed revisions, and Duke Energy filed a revised HPMP on November 5, 2014. The executed PA, which Duke Energy signed, incorporates the HPMP, which supersedes the one filed with the license application and mentioned in the Relicensing Agreement.

²¹ 33 U.S.C. § 1341(a)(1) (2012).

²² 33 U.S.C. § 1341(d) (2012).

²³ See letter from North Carolina Division of Water Quality (now known as the North Carolina Division of Water Resources) dated April 7, 2011, and filed with the license application.

forth in Appendix A of this order and incorporated into the license by Ordering Paragraph (D).

53. The South Carolina certification includes three conditions to protect water quality and ensure the project complies with state water quality standards, two of which are general or administrative and are not discussed further.²⁴ The remaining condition requires Duke Energy to implement the Relicensing Agreement's proposed license articles A-2.0 and A-7.0, which are reproduced for reference in Appendix A of this order.

54. Under article A-7.0 of the Relicensing Agreement, Duke Energy must continuously monitor DO concentrations during the month of August, for the term of the license, in both the Jocassee and Keowee Developments' tailwaters to demonstrate compliance with South Carolina's water quality standards.

55. In the EA,²⁵ Commission staff did not recommend water quality monitoring in the tailrace of each development during August because: (1) existing water quality in the reservoirs and tailwaters is meeting or exceeding levels consistent with state water quality standards, and is consistent with levels supporting designated uses, and no issues have been raised concerning pH and total dissolved gas; (2) water quality modeling results indicate that under the proposed project operation suitable DO levels and water temperatures would exist for the propagation of aquatic life in the Keowee Development releases; (3) there are no proposed changes in project operation that would alter water quality from existing conditions in the Jocassee Development tailwaters; and (4) the fishery at the project is considered excellent.²⁶ Nonetheless, because South Carolina DHEC's certification requires Duke Energy to monitor DO, the requirement is included in this license.

²⁴ The general terms and conditions stipulate that: (1) Duke Energy take all measures necessary to prevent contaminants resulting from project operation and maintenance activities from entering adjacent waters or wetlands; and (2) any applicant to Duke Energy for a large water intake or major water withdrawal from the project must comply with the Surface Water Withdrawal, Permitting, Use And Reporting Act, S.C. Code Ann. §§ 49-4-10 et seq.

²⁵ See EA at 232.

²⁶ Lake Jocassee supports a productive cold-water fishery for brown and rainbow trout.

COASTAL ZONE MANAGEMENT

56. Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA),²⁷ the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's coastal zone management program, or the agency's concurrence is conclusively presumed by its failure to act within 6 months of its receipt of the applicant's certification.

57. By letter dated November 31, 2013,²⁸ South Carolina DHEC notified Duke Energy that because the project is not located within the Coastal Management Zone for South Carolina, nor would the project affect South Carolina coastal resources, a consistency certification is not required.

SECTION 18 FISHWAY PRESCRIPTION

58. Section 18 of the FPA²⁹ provides that the Commission shall require the construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate.

59. By letter filed March 30, 2015, the Secretary of the Interior requested that the Commission reserve authority to prescribe fishways. Consistent with Commission policy, Article 405 of this license reserves the Commission's authority to require fishways that may be prescribed by Interior for the Keowee-Toxaway Project.

THREATENED AND ENDANGERED SPECIES

60. Section 7(a)(2) of the Endangered Species Act (ESA) of 1973³⁰ requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of their designated critical habitat.

61. In a letter filed on August 5, 2015, FWS identified 16 federally listed species including a mussel species, a lichen species, 9 plant species, 4 mammal species, and a

²⁷ 16 U.S.C. § 1456(c)(3)(A) (2012).

²⁸ See Duke Energy's August 27, 2014 License Application, Exhibit E1 at Appendix E7.

²⁹ 16 U.S.C. § 811 (2012).

³⁰ 16 U.S.C. § 1536(a) (2012).

reptile species that are known to occur in one or more of the three counties in the project area. The mussel species is the endangered Appalachian elktoe. The lichen species is the endangered rock gnome lichen. The plant species are: the endangered smooth coneflower, persistent trillium, mountain sweet pitcher plant, spreading avens, black-spored quillwort; and the threatened small whorled pogonia, dwarf-flowered heartleaf, swamp pink, and Virginia spiraea. The mammal species are: the endangered Carolina northern flying squirrel, Indiana bat, and gray bat; and the threatened northern long-eared bat. The reptile species is the threatened bog turtle.³¹

62. FWS has designated critical habitat for Appalachian elktoe and Indiana bat, but no critical habitat occurs in the project area.³²

63. In the EA,³³ staff determined that relicensing the project would have no effect on the Appalachian elktoe, rock gnome lichen, persistent trillium, mountain sweet pitcher plant, spreading avens, black-spored quillwort, small whorled pogonia, dwarf-flowered heartleaf, swamp pink, Virginia spiraea, Carolina northern flying squirrel, and bog turtle because none of these species have been identified within the project boundary or in areas that could be affected by project-related activities. Therefore, no further action under the ESA is required for these species. By letter filed November 12, 2015, FWS concurred with the "no effect" determination for these species.

64. In the EA,³⁴ staff also determined that relicensing the project would not be likely to adversely affect the smooth coneflower, Indiana bat, gray bat, and northern long-eared bat because there is no evidence that potentially suitable habitat within the project boundary is currently being used by these species. None of these species have been identified within the project boundary or in areas that could be affected by project-related activities. Staff found that the vegetation management measures included in Duke Energy's SMP would benefit these species by minimizing disturbances to native vegetation. By letter filed November 12, 2015, FWS concurred with the "not likely to adversely affect" determination for these species.³⁵ Therefore, no further action under the ESA is required for these species.

³¹ Bog turtles are listed as threatened in the U.S. except in Georgia, North Carolina, South Carolina, and Virginia, where they are listed as threatened due to similarity of appearance (i.e., T (S/A)). See EA at 7.

³² See EA at 137 and 142.

³³ See EA at 142-146.

³⁴ See EA at 143 and 146-149.

³⁵ In its November 12, 2015 letter, FWS concurred with Commission staff's
(continued ...)

NATIONAL HISTORIC PRESERVATION ACT

65. Under section 106 of the National Historic Preservation Act (NHPA)³⁶ and its implementing regulations,³⁷ federal agencies must take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register of Historic Places (defined as historic properties) and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking. This process generally requires the Commission to consult with the SHPO to determine whether and how a proposed action may affect historic properties, and to seek ways to avoid or minimize any adverse effects.

66. To satisfy these responsibilities, the Commission executed a PA with the North Carolina SHPO on May 8, 2015, and the South Carolina SHPO on May 19, 2015, and invited Duke Energy, Eastern Band of Cherokee Indians, United Keetoowah Band of Cherokee Indians in Oklahoma, Catawba Indian Nation, and Cherokee Nation to concur with the stipulations of the PA. Duke Energy and the Catawba Indian Nation concurred. The PA requires Duke Energy to implement the HPMP, filed on November 5, 2014, for the term of any new license issued for this project. Execution of the PA demonstrates the Commission's compliance with section 106 of the NHPA. Article 408 requires Duke Energy to implement the PA and HPMP.

RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES PURSUANT TO SECTION 10(J) OF THE FPA

finding that the project, with staff's recommended measures, is not likely to adversely affect these species. In support, FWS referenced proposed measures to implement a shoreline management plan and to develop a species protection plan to address any project-related effects if a particular federally listed species is found to occur within the project boundary. As discussed in the EA, staff did not include the species protection plans as part of the staff alternative. Rather, under the Relicensing Agreement, Duke Energy will develop the plans in the future if they are found to be necessary. Because the plans are not currently needed to protect federally listed species, the license does not require them.

³⁶ Section 106 of the National Historic Preservation Act of 1966, as amended, 54 U.S.C. § 306108, Pub. L. No. 113-287, 128 Stat. 3188 (2014). (The National Historic Preservation Act was recodified in Title 54 in December 2014.)

³⁷ 36 C.F.R. Part 800 (2015).

67. Section 10(j)(1) of the FPA³⁸ requires the Commission, when issuing a license, to include conditions based on recommendations submitted by federal and state fish and wildlife agencies pursuant to the Fish and Wildlife Coordination Act,³⁹ to “adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)” affected by the project. No agency filed section 10(j) recommendations for the Keowee-Toxaway Project.

SECTION 10(a)(1) OF THE FPA

68. Section 10(a)(1) of the FPA⁴⁰ requires that any project for which the Commission issues a license be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce; for the improvement and utilization of waterpower development; for the adequate protection, mitigation, and enhancement of fish and wildlife; and for other beneficial public uses, including irrigation, flood control, water supply, recreation, and other purposes.

A. Reservoir Elevations and Project Operating Regimes

69. Duke Energy operates the Keowee-Toxaway Project in coordination with the Bad Creek Project. Water from Lake Jocassee (lower reservoir) is pumped into the Bad Creek Reservoir (upper reservoir) and is then used by the Bad Creek Project to generate power daily during peak demand periods. Duke Energy owns both the Bad Creek and Keowee-Toxaway Projects and proposes to continue operating them in a coordinated manner during the term of the new license.

70. When the Commission does not license related projects together, as is the case here, the Commission may authorize projects separately, but coordinate the projects’ operations pursuant to section 10(a). Therefore, Article 401 requires that the Jocassee Reservoir be available to the Bad Creek Project for its pumped-storage operations.

71. Duke Energy proposes to operate the project in accordance with the 2014 Operating Agreement signed by the Corps, SEPA, and Duke Energy, and as described above. In the EA,⁴¹ staff concluded that the proposed operating levels at Lake Keowee and Lake Jocassee would continue to provide protection for water quality, aquatic biota,

³⁸ 16 U.S.C. § 803(j)(1) (2012).

³⁹ 16 U.S.C. §§ 661 *et seq.* (2012).

⁴⁰ 16 U.S.C. § 803(a)(1) (2012).

⁴¹ *See* EA at 68-69.

aquatic habitat, and recreation resources by minimizing fluctuations of the water surface in each lake; thus, Article 402 requires these operating elevations.

72. Petitioners commented that Duke Energy's provisions for lowering the minimum reservoir elevation of Lake Keowee from the existing effective minimum of 794.6 feet to 790 feet would result in greater frequency and duration of lower lake levels and lead to a decline in value of lakefront homes. They recommended that the minimum reservoir elevation for Lake Keowee be set at 793 feet. However, as proposed by Duke Energy, Lake Keowee's reservoir level should actually be higher (i.e., 796 feet) under normal inflows, and would fall below 796 feet only during periods of drought when the LIP is triggered. In the EA,⁴² staff concluded that elevations below 793 feet would occur infrequently and have minimal effects on the local economy of Lake Keowee. Therefore, Article 403 requires the proposed LIP.

73. In the EA,⁴³ staff recommended the MEP to define project operations during emergencies. Article 404 requires the proposed MEP.

B. Water Quality Monitoring

74. Interior recommends that Duke Energy install permanent water quality monitoring stations in the tailwaters, bypassed reaches, and reservoirs of the project. Interior recommends that the water quality monitoring include, at a minimum, collecting data on DO, water temperature, turbidity, pH, and total dissolved gas on an hourly basis. In the EA,⁴⁴ Commission staff did not recommend this provision, concluding that: (1) existing water quality in the reservoirs and tailwaters are at levels meeting or exceeding those established by state water quality standards; (2) water quality modeling results indicate that under the proposed project operation suitable DO levels and water temperatures would exist for the propagation of aquatic life in the Keowee Development releases; (3) no proposed changes in project operations would alter water quality from existing conditions in the Jocassee Development tailwaters; and (4) the fishery at the project is considered excellent. Interior did not object to this approach.⁴⁵ Based on the reasons outlined above, the license does not include Interior's recommended water quality monitoring provisions.

C. Recreation Management

⁴² See EA at 230-232.

⁴³ See EA at 223-224.

⁴⁴ See EA at 233.

⁴⁵ See letter from Interior filed October 30, 2015.

75. Under section 6.2 of the Relicensing Agreement, Duke Energy will implement the recreation plan it filed with its license application. The recreation plan includes a list of proposed enhancement measures, conceptual plans, and management strategies for the 12 existing and 2 proposed new project recreation sites. As discussed in the EA,⁴⁶ these enhancement measures would protect, improve, and enhance recreation resources within the project boundary. However, in the EA,⁴⁷ staff recommended modifications to the recreation plan because some of the proposals either require action by third-party entities that cannot be enforced by the Commission or lack adequate specificity. These modifications to the recreation plan are discussed below.

1. Requirements for Third-Party Lessees

76. The recreation enhancement measures proposed by Duke Energy for Mile Creek County Park and Crow Creek Access Area are contingent on the actions of third-party entities, over which the Commission has no jurisdiction. As described in its proposal, Duke Energy would only construct campsites, camping cabins, and sheltered fishing stations at Mile Creek County Park if Pickens County, South Carolina agrees to operate and maintain the facilities. At the Crow Creek Access Area, Duke Energy's proposal assumes The Reserve at Lake Keowee will construct the previously Commission-approved⁴⁸ project recreation facilities (including lighting, expanded parking, a courtesy dock, picnic area, and bank fishing trail). Duke Energy indicated that if the facilities are not constructed by The Reserve at Lake Keowee, Duke Energy would install bank fishing signage and maintain the sight as-is, without the additional recreation enhancement measures.

77. However, as Commission staff found in the EA,⁴⁹ these facilities are needed now. Therefore, Article 406 requires Duke Energy to construct the recreation amenities proposed for both Mile Creek County Park and Crow Creek Access Area. Further, in order to ensure that project recreation sites are improved, operated, and maintained in ways that are consistent with project purposes, Article 406 requires Duke Energy to ensure that all future improvements made to project recreation sites by lessees as part of the AAI must be consistent with the recreation plan, identified in as-built drawings of project recreation facilities, and approved by the Commission where appropriate.

⁴⁶ See EA at 170.

⁴⁷ See EA at 225-226 and 229.

⁴⁸ *Duke Energy Carolinas, LLC* 132 FERC ¶ 62,045 (2010).

⁴⁹ See EA at 225-226.

2. Warpath Access Area

78. The Warpath Access Area is a 63-acre project recreation site containing a 38-space trailered vehicle parking area, 3 concrete boat ramps, and 2 courtesy docks. Duke Energy's proposed recreation plan contains provisions for significant reconfiguration of the existing facilities, including constructing a campground, swim beach, picnic areas, and cabins. These facilities were proposed by Warpath Development, Inc. through the AAI and approved by Commission staff in 2006 as a non-project use of project lands and waters⁵⁰ and again in 2008 as part of the Recreation Management Plan for the Keowee-Toxaway Project.⁵¹ Effective March 4, 2016, however, Duke Energy terminated Warpath Development, Inc.'s lease of the Warpath Access Area, and Duke Energy now proposes to only install bank fishing signage at the site.

79. During the Recreation Use and Needs Study conducted as part of the relicensing, the Warpath Access Area was the only site where use exceeded capacity on holiday weekends, despite less-crowded alternatives. It was also the second-most preferred boat launch area because of its location and availability of parking. As discussed in the EA,⁵² staff found that, given Duke Energy's estimates for future recreation growth, the high level of use at Warpath Access Area could result in adverse effects on environmental resources (i.e., vehicular or pedestrian use of un-designated areas) or reduce the quality of the recreation experience at the site. Duke Energy's proposal to maintain the site as-is and install bank fishing signage would not address capacity issues associated with boat launch use during the peak recreation season.

80. Commission staff did not recommend that Duke Energy construct the amenities proposed in the 2008 recreation plan,⁵³ which would require significant reconfiguration of the site and change the character of the existing recreation experience. Staff determined that such amenities do not meet the need identified in Duke Energy's Recreation Use and Needs Study. Rather, staff recommended that the recreation plan be modified to include a provision to monitor capacity and facility condition at the Warpath Access Area annually during the summer recreation season. This change will give Duke Energy flexibility to address negative effects of boat launch overuse, without making significant changes to the access area that may not be warranted at this time. Therefore, Article 406 requires that the recreation plan be modified to include provisions for

⁵⁰ *Duke Power Co., LLC*, 115 FERC ¶ 62,327 (2006).

⁵¹ *Duke Energy Carolinas, LLC*, 132 FERC ¶ 62,045 (2010).

⁵² See EA at 227-228.

⁵³ See EA at 222.

monitoring the capacity and condition of the Warpath Access Area over the term of the recreation plan.

3. World of Energy Picnic Area

81. Duke Energy did not include the World of Energy Picnic Area in its proposed recreation plan. However, the Commission-approved 2008 recreation plan recognizes the World of Energy Picnic Area as a project recreation site and identifies it as a popular destination for bank fishing. In addition, the order approving the 2008 plan required that Duke Energy bring the World of Energy Picnic Area into the project boundary.⁵⁴ To date, Duke Energy has not incorporated the World of Energy Picnic Area into the project boundary and did not include it in its proposed recreation plan.

82. As discussed in the EA,⁵⁵ although World of Energy is located on Duke Energy-owned lands associated with Oconee Nuclear Station, the site provides access to Lake Keowee and includes water-based recreation facilities including a boat dock and fishing pier. Enclosing the recreation facilities at World of Energy Picnic Area within the project boundary and modifying the recreation plan to include World of Energy Picnic Area as a project recreation site will ensure the area is operated and maintained over the term of the new license. Therefore, Article 203 requires Duke Energy to file revised exhibit G drawings enclosing, within the project boundary, all lands associated with the recreation facilities at the World of Energy Picnic Area, and Article 406 requires modifications to the recreation plan to include World of Energy Picnic Area as a project recreation site.

4. Shoreline Stabilization

83. As part of the recreation plan, Duke Energy proposed to stabilize a total of about 3,000 linear feet of shoreline associated with three project recreation sites: the existing Fall Creek Access Area and the new High Falls II and Mosquito Point Access Areas. In the EA,⁵⁶ Commission staff recommended that Duke Energy also include, in its recreation plan, provisions for stabilizing an additional 6,250 linear feet of shoreline associated with certain islands in Lake Keowee that have been designated by Duke Energy for day-use recreation in both the proposed recreation plan and SMP. Staff concluded that stabilizing the shorelines would protect the islands from potential erosion and make them safer to use. Therefore, Article 406 requires Duke Energy to modify the

⁵⁴ *Duke Energy Carolinas, LLC*, 132 FERC ¶ 62,045 (2010).

⁵⁵ See EA at 225.

⁵⁶ See EA at 228.

recreation plan to include a provision to stabilize the islands' shorelines (i.e., 6,250 linear feet) to protect them for day-use recreation.⁵⁷

D. Shoreline Management Plan

84. Duke Energy proposes to implement an SMP filed with the license application. As discussed in the EA,⁵⁸ the SMP would allow for residential and commercial development of the project's reservoir shorelines while maintaining areas for natural resource protection and recreation. In the EA, Commission staff recommended approving the SMP with the modifications described below.

1. Provisions for Dock Expansions

85. The SMP contains a provision allowing existing dock owners to apply for permits to expand their private docks by up to 200 square feet beyond the SMP's maximum of 1,000 square feet. The SMP limits the timeframe to apply for such dock expansions to a single 365-day period. Petitioners commented that this timeframe was unnecessarily narrow, and that dock owners may not know if dock expansions would be necessary or helpful in reaching deeper water before the 365-day window expired.

86. In the EA,⁵⁹ staff found a 365-day timeframe for accepting permit applications to be problematic. In the license application, Duke Energy's proposal for allowing dock modifications was tied to the proposal to restrict the minimum elevation to 790-foot during extreme low-flow events. Currently, Oconee Nuclear Station's operational constraints limit the reservoir elevation to 794.6 feet. Operational changes to Oconee Nuclear Station will be complete by December 1, 2019; however, as described in the SMP, the 365-day period could begin (and end) in advance of implementation of the new minimum reservoir elevation. Therefore, Article 407 requires the SMP be modified to allow dock owners⁶⁰ to apply for exemptions to modify or expand their docks by up to 200 square feet to reach deeper water through December 31, 2020.

⁵⁷ Although Duke Energy proposed to stabilize the shoreline of certain islands in Lake Keowee as an off-license measure in the Relicensing Agreement, the islands are used by the public and designated by Duke Energy in the recreation plan and SMP for day-use recreation. Therefore, the stabilization of their shorelines is properly included as a condition of the license.

⁵⁸ See EA at 185.

⁵⁹ See EA at 229.

⁶⁰ As described in the SMP, this provision applies only to existing dock owners as of December 1, 2013.

2. Annual Reporting

87. Duke Energy's proposed SMP contains updated procedures that allow for minor changes to the shoreline management guidelines, shoreline classification maps, and associated lake use restrictions to protect newly discovered resources such as archeological or historic sites, Threatened or Endangered Species, Special Concern Species, or to correct mapping errors. To facilitate Commission administration of the license, in the EA,⁶¹ staff recommended modifying the SMP to require annual reporting to document any changes made to the SMP and its component maps, restrictions, and guidelines. Article 407 requires this modification.

ADMINISTRATIVE PROVISIONS

A. Annual Charges

88. The Commission collects annual charges from licensees for administration of the FPA. Article 201 provides for the collection of such funds.

B. Exhibit F and G Drawings

89. The Exhibit F drawings are approved and made part of the license (ordering paragraph (B)). The Commission requires licensees to file sets of approved project drawings in electronic file format. Article 202 requires the filing of these drawings.

90. The Exhibit G drawings filed with the license application do not enclose the World of Energy Picnic Area which is a project recreation facility. Therefore, the Exhibit G drawings are not approved, and Article 203 requires Duke Energy to file a revised Exhibit G drawing(s) that encloses the World of Energy Picnic Area within the project boundary.

C. Amortization Reserve

91. The Commission requires that for new major licenses, non-municipal licensees must set up and maintain an amortization reserve account upon license issuance. Article 204 requires the establishment of the account.

D. Headwater Benefits

92. Some projects directly benefit from headwater improvements that were constructed by other licensees, the United States, or permittees. Article 205 requires the licensee to reimburse such entities for these benefits if they were not previously assessed and reimbursed.

⁶¹ See EA at 230.

E. Project Modifications Resulting from Environmental Requirements

93. Article 301 requires the licensee to provide the Commission's Division of Dam Safety and Inspections' Atlanta Regional Office with proposed project modifications resulting from environmental requirements.

F. Commission Notification of LIP Operations

94. Ordering Paragraph (D) requires implementing the LIP. The LIP requires that the Commission be notified once LIP stage 1 has been reached, and each subsequent stage. Article 403 specifies that the Commission be notified within 10 days of each change in operation once Stage 1 of the LIP is reached.

G. Use and Occupancy of Project Lands and Waters

95. Requiring a licensee to obtain prior Commission approval for every use of occupancy of project land would be unduly burdensome. Therefore, Article 409 allows the licensee to grant permission, without prior Commission approval, for the use and occupancy of project lands for such minor activities as landscape planting. Such uses must be consistent with the purposes of protecting and enhancing the scenic, recreational, and environmental values of the project.

STATE AND FEDERAL COMPREHENSIVE PLANS

96. Section 10(a)(2) of the FPA⁶² requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project.⁶³ Under section 10(a)(2)(A) of the FPA, federal and state agencies filed 53 comprehensive plans that address various resources in North Carolina and South Carolina. Of these, the Commission staff identified and reviewed 16 comprehensive plans that are relevant to this project.⁶⁴ No conflicts were found.

⁶² 16 U.S.C. § 803(a)(2)(A) (2012).

⁶³ Comprehensive plans for this purpose are defined at 18 C.F.R. § 2.19 (2015).

⁶⁴ The list of applicable plans can be found in Appendix F of the EA for the project.

APPLICANT'S PLANS AND CAPABILITIES

97. In accordance with sections 10(a)(2)(C) and 15(a) of the FPA,⁶⁵ this order includes an evaluation of Duke Energy's record as a licensee for these areas: (A) conservation efforts; (B) compliance history and ability to comply with the new license; (C) safe management, operation, and maintenance of the project; (D) ability to provide efficient and reliable electric service; (E) need for power; (F) transmission services; (G) cost effectiveness of plans; and (H) actions affecting the public. The finding for each area is provided below.

A. Conservation Efforts

98. Section 10(a)(2)(C) of the FPA requires the Commission to consider the extent of electricity consumption efficiency improvement programs in the case of license applicants primarily engaged in the generation or sale of electric power, like Duke Energy. Duke Energy has provided conservation services for its electricity customers since 1971. Duke Energy has several programs to promote conservation and energy efficiency for residential, commercial, industrial, and agricultural customers, including: (1) making available special electric rates to customers who modify or build their homes to meet insulation and other energy conservation requirements and to large industrial customers that shift usage from peak times; (2) providing the public with energy saving tips through local advertisements; (3) making available an online energy audit suitable for individual residences or small business; and (4) providing on-site energy needs assessments along with recommendations on how to solve energy-related problems for larger businesses. These programs show that Duke Energy is making an effort to conserve electricity and has made a satisfactory good faith effort to comply with section 10(a)(2)(C) of the FPA.

B. Compliance History and Ability to Comply with the New License

99. Based on a review of Duke Energy's compliance with the terms and conditions of the existing license, Commission staff finds that Duke Energy's overall record of making timely filings and compliance with its license is satisfactory. Therefore, staff believes Duke Energy can satisfy the conditions of a new license.

C. Safe Management, Operation, and Maintenance of the Project

100. Commission staff has reviewed Duke Energy's management, operation, and maintenance of the Keowee-Toxaway Project pursuant to the requirements of 18 C.F.R. Part 12 and the Commission's Engineering Guidelines. Staff concludes that the dams and other project works are safe, and that there is no reason to believe that Duke Energy

⁶⁵ 16 U.S.C. §§ 803(a)(2)(C) and 808(a) (2012).

cannot continue to safely manage, operate, and maintain these facilities under a new license.

D. Ability to Provide Efficient and Reliable Electric Service

101. Commission staff has reviewed Duke Energy's plans and its ability to operate and maintain the project in a manner most likely to provide efficient and reliable electric service. Staff's review indicates that Duke Energy has devices that monitor structural movement or stress, seepage, uplift, and equipment failure at the project. Duke Energy regularly inspects the project turbine generator units to ensure they continue to perform in an optimal manner, schedules maintenance to minimize effects on energy production, and, since the project has been in operation, has undertaken several initiatives to ensure the project is able to operate reliably into the future. Staff concludes that Duke Energy is capable of operating the project to provide efficient and reliable electric service in the future.

E. Need for Power

102. The Keowee-Toxaway Project provides hydroelectric generation to meet part of North Carolina and South Carolina's power requirements, resource diversity, and capacity needs. The project, as licensed, will have an installed capacity of 867.60 MW, and generate approximately 1,018,258 MWh of electricity annually.

103. To assess the need for the project's power, Commission staff looked at the needs in the operating region in which the project is located. The project will be located in the Southeastern Electric Reliability Council (SERC) region, which is one of eight regional reliability councils of the North American Electric Reliability Corporation (NERC). NERC annually forecasts electrical supply and demand nationally and regionally for a 10-year period. According to NERC's December 2015 forecast report,⁶⁶ peak season energy demand in the SERC region will increase from 44,934 MW in 2016 to 50,502 MW in 2025, an increase of about 1.2 percent per year over the ten-year period. Commission staff concludes that the project's power, and its contribution to the region's diversified generation mix, will help meet a need for power in the region.

F. Transmission Services

104. The project's transmission facilities include the generator leads, station transformers, buses, and switch yards located near some of the project's developments, and in some cases transmission lines connecting the project to the point of interconnection with the grid. Neither Duke Energy proposes, nor does this license

⁶⁶ North American Electric Reliability Corporation. 2015 Long Term Reliability Assessment. December 2015.

require, any changes that would affect this project's, or other transmission services in the region.

G. Cost Effectiveness of Plans

105. Duke Energy proposes operational measures in accordance with a 2014 Operating Agreement that includes provisions for operating under normal conditions, low inflow conditions (LIP), and for maintenance or emergencies (MEP). Duke Energy also proposes several measures and plans to enhance fish and wildlife, terrestrial, recreation, and cultural resources at the project. Based on Duke Energy's record as an existing licensee, Commission staff concludes that these proposals are likely to be carried out in a cost-effective manner.

H. Actions Affecting the Public

106. Duke Energy provided extensive opportunity for public involvement in the development of its application for a new license for the Keowee-Toxaway Project. In addition to using the project to help meet local power needs, during the previous license period Duke Energy provided facilities to enhance the public use of project lands and facilities, and operated the project with consideration for the protection of downstream uses of the Toxaway, Keowee, and Little Rivers.

PROJECT ECONOMICS

107. In determining whether to issue a new license for an existing hydroelectric project, the Commission considers a number of public interest factors, including the economic benefits of project power. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,⁶⁷ the Commission uses current costs to compare the costs of the project and likely alternative power with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and of reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

108. In applying this analysis to the Keowee-Toxaway Project, Commission staff considered three options: no action, Duke Energy's proposal, and the project as licensed herein.⁶⁸ Under the no action alternative, the project would continue to operate as it does

⁶⁷ 72 FERC ¶ 61,027 (1995).

⁶⁸ Details of staff's economic analysis for the project as licensed herein and for various alternatives are included in the EA issued on March 28, 2016, at section 4.0, *Developmental Analysis*.

now. The project generates an average of 1,018,258 MWh of electricity annually. Multiplying staff's estimate of average generation by the alternative power cost of \$142.72/MWh⁶⁹ yields a total value of the project's power of \$145,325,782 in 2015 dollars. The average annual project cost is about \$38,254,656, or \$37.57/MWh. To determine whether the proposed project is currently economically beneficial, staff subtracts the project's cost from the value of the project's power. Therefore, the project costs \$107,071,126, or \$105.15/MWh, less to produce power than the likely alternative cost of power.

109. As proposed by Duke Energy, the project would have an authorized capacity of 867.6 MW, and an average annual generation of 1,191,013 MWh valued at \$148,519,321, or about \$124.70/MWh. The average annual project cost is about \$39,592,353, or \$33.24/MWh. Therefore, subtracting the project's cost from the value of power, in the first year of operation, the project would produce power at a cost of \$108,926,968 or \$91.45/MWh, less than the likely alternative cost of power.

110. As licensed herein, with the mandatory conditions and staff measures, the project would have an authorized capacity of 867.6 MW, and an average annual generation of 1,191,013 MWh valued at \$148,519,321, or about \$124.70/MWh. The average annual project cost is about \$39,611,581 or \$33.25/MWh. Therefore, subtracting the project's cost from the value of power, in the first year of operation, the project would produce power at a cost of \$108,907,740 or \$91.44/MWh, less than the likely alternative cost of power.

111. In considering public interest factors, the Commission takes into account that hydroelectric projects offer unique operational benefits to the electric utility system (ancillary service benefits). These benefits include the ability to help maintain the stability of a power system, such as by quickly adjusting power output to respond to rapid changes in system load, and to respond rapidly to a major utility system or regional blackout by providing a source of power to help restart fossil-fuel based generating stations and put them back on line.

COMPREHENSIVE DEVELOPMENT

112. Sections 4(e) and 10(a)(1) of the FPA⁷⁰ require the Commission to give equal consideration to the power development purposes and to the purposes of energy

⁶⁹ The alternative power cost was estimated for 2015, and includes the value of energy generated plus a value for dependable capacity. The value of energy is a composite of on-peak and off-peak rates.

⁷⁰ 16 U.S.C. §§ 797(e) and 803(a)(1) (2012).

conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued must be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

113. The EA for the project contains background information, analysis of effects, and support for related license articles. Based on the record of this proceeding, including the EA and the comments thereon, licensing the Keowee-Toxaway Project as described in this order would not constitute a major federal action significantly affecting the quality of the human environment. The project will be safe if operated and maintained in accordance with the requirements of the license.

114. Based on Commission staff's independent review and evaluation of the project, recommendations from the resource agencies and other stakeholders, and the no-action alternative, as documented in the EA, the proposed Keowee-Toxaway Project, as licensed herein, is best adapted to a comprehensive plan for improving or developing the upper Savannah River Basin.

115. This alternative was selected because: (1) issuance of a new license will serve to maintain a beneficial, dependable, and inexpensive source of electric energy; and (2) the required environmental measures will protect and enhance fish and wildlife resources, water quality, recreational resources, and historic properties.

LICENSE TERM

116. Section 15(e) of the FPA⁷¹ provides that any new license issued shall be for a term that the Commission determines to be in the public interest, but not less than 30 years or more than 50 years. The Commission's general policy is to establish 30-year terms for projects with little or no redevelopment, new construction, new capacity, or environmental mitigation and enhancement measures; 40-year terms for projects with a moderate amount of such activities; and 50-year terms for projects with extensive measures.⁷² This license authorizes no new construction or new capacity, and only a minor amount of new environmental mitigation measures. Consequently, a 30-year license term for the Keowee-Toxaway Project is appropriate.

⁷¹ 16 U.S.C. § 808(e) (2012).

⁷² See *Consumers Power Co.*, 68 FERC ¶ 61,077, at 61,383-84 (1994).

117. Because the term of the current license does not expire until August 31, 2016, this license order is not effective until September 1, 2016.⁷³

The Director orders:

(A) This license is issued to Duke Energy Carolinas LLC (licensee), for a period of 30 years, effective September 1, 2016, to operate and maintain the Keowee-Toxaway Hydroelectric Project. This license is subject to the terms and conditions of the Federal Power Act (FPA), which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The Project consists of:

(1) All lands, to the extent of the licensee's interests in these lands, described in the project description and the project boundary discussion of this order.

(2) Projects works which include:

Jocassee Development consisting of: (a) a 7,980 acre reservoir (Lake Jocassee) at a full pond elevation of 1,110 feet above mean sea level (AMSL); (b) the 385-foot-high, 1,800-foot-long Jocassee Dam which includes two cylindrical concrete/steel intake structures with two power tunnels connecting the intakes of the powerhouse; (c) two earthfill saddle dikes; (d) a powerhouse containing four reversible pump-turbine units with a total installed capacity of 710.1 MW; (e) a generator step-up transformer feeding a 230-kilovolt (kV) transmission system; (f) a 200-foot-long tailrace emptying into Lake Keowee; and (g) appurtenant facilities.

Keowee Development consisting of: (a) a 17,660-acre reservoir (Lake Keowee) at a full pond elevation of 800 feet AMSL; (b) the 165-foot-high, 3,500-foot-long Keowee Dam which includes (i) a cylindrical concrete/steel intake structure with a power tunnel connected to the powerhouse, and (ii) a 176-foot-wide concrete gated spillway, including an entrance channel and four 38-foot-wide by 35-foot-high Tainter gates; (c) the 165-foot-high, 1,800-foot-long Little River Dam; (d) four earthfill saddle dikes, Saddle Dike A, B, C and D; (e) the Oconee Nuclear Station intake dike; (f) a concrete/steel powerhouse with two Francis turbine/generator units with a total authorized installed capacity of 157.5 MW; (g) a generator step-up transformer, which feeds a 230-kV transmission system; and (h) appurtenant facilities.

⁷³ For this reason, the various deadlines in the license articles are measured from the September 1, 2016 effective date of this license, rather than from the order issuance date.

The project works generally described above are more specifically shown and described by those approved portions of Exhibits A and F shown below:

Exhibit A: Project Description, filed on August 27, 2014.

Exhibit F: The following Exhibit F drawings, filed on August 27, 2014:

KEOWEE DEVELOPMENT

Exhibit No.	FERC No.	Title
F-1	1001	Keowee Dam Area Site Plan
F-2	1002	Little River Dam Area Site Plan
F-3	1003	Sections and Details, Keowee Dam
F-4	1004	Sections and Details, Little River Dam
F-5	1005	Sections and Details, Power House and Penstocks

JOCASSEE DEVELOPMENT

Exhibit No.	FERC No.	Title
F-6	1006	North Carolina/ South Carolina, Plans for Jocassee Dam and Powerhouse Area
F-7	1007	North Carolina/ South Carolina, Sections and Details, Jocassee Dam
F-8	1008	North Carolina/ South Carolina, Sections and Details, Powerhouse and Penstocks

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project, all portable property that may be employed in connection with the project, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) Exhibits A and F described above are approved and made part of this license. The Exhibit G drawings filed as part of the application for license do not conform to the Commission's regulations and are not approved.

(D) This license is subject to the conditions submitted by the South Carolina Department of Health and Environmental Control under section 401(a)(1) of the Clean Water Act, 33 U.S.C. § 1341(a)(1)(2012), as those conditions are set forth in Appendix A to this order.

(E) This license is also subject to the articles set forth in Form L-10 (Oct. 1975), entitled “Terms and Conditions of License for Constructed Major Project Affecting the Interests of Interstate or Foreign Commerce,” (*see* 54 F.P.C. 1792 et seq.), as reproduced at the end of this order, and the following additional articles:

Article 201. Administrative Annual Charges. The licensee must pay the United States annual charges, effective September 1, 2016, and as determined in accordance with the provisions of the Commission’s regulations in effect from time to time, for the purposes of reimbursing the United States for the cost of administration of Part I of the Federal Power Act. The authorized installed capacity for that purpose is 867.6 megawatts.

Article 202. Approved Exhibit F Drawings. Within 45 days of the effective date of the license, as directed below, the licensee must file the approved exhibit F drawings (F-1001 through F-1008.) in electronic file format on compact disks with the Secretary of the Commission, ATTN: OEP/DHAC.

Digital images of the approved exhibit F drawings must be prepared in electronic format. Prior to preparing each digital image, the FERC Project-Drawing Number (i.e., P-2503-1001 through P-2503-1008) must be shown in the margin below the title block of the approved drawing. Exhibit F drawings must be segregated from other project exhibits, and identified as **Critical Energy Infrastructure Information (CEII) material under 18 C.F.R. §388.113(c)**. Each drawing must be a separate electronic file, and the file name must include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension in the following format [P-2503-1, F-1001, Keowee Dam Area Site Plan, MM-DD-YYYY.TIF]. All digital images of the exhibit drawings must meet the following format specification:

IMAGERY – black & white raster file

FILE TYPE – Tagged Image File Format, (TIFF) CCITT Group 4
(also known as T.6 coding scheme)

RESOLUTION – 300 dots per inch (dpi) desired, (200 dpi min)

DRAWING SIZE FORMAT – 22” x 34” (minimum), 24” x 36” (maximum)

FILE SIZE – less than 1 megabyte desired

Article 203. Revised Exhibit G Drawings. Within 90 days of the effective date of the license, the licensee must file, for commission approval, revised Exhibit G drawings enclosing within the project boundary all principal project works necessary for operation and maintenance of the project, including the recreation amenities at World of Energy Picnic Area. The Exhibit G drawings must comply with sections 4.39 and 4.41 of the Commission's regulations.

Article 204. Amortization Reserve. Pursuant to section 10(d) of the Federal Power Act, a specified reasonable rate of return upon the net investment in the project must be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee must set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee must deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee must set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee must maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves must be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly included in the licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios must be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity must be the interest rate on 10-year government bonds (reported as the Treasury Department's 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 205. Headwater Benefits. If the licensee's project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the licensee must reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license. The benefits will be assessed in accordance with Part 11, Subpart B, of the Commission's regulations.

Article 301. Project Modification Resulting from Environmental Requirements. If environmental requirements under this license require modification that may affect the

project works or operations, the licensee must consult with the Commission's Division of Dam Safety and Inspections—Atlanta Regional Engineer. Consultation must allow sufficient review time for the Commission to ensure that the proposed work does not adversely affect the project works, dam safety, or project operation.

Article 401. Use of Jocassee Reservoir. The Jocassee Reservoir must be available to the Bad Creek Pumped Storage Project, Project No. 2740, as a lower pool for pumped-storage operations.

Article 402. Reservoir Elevations. Upon the effective date of this license, the licensee must operate the Keowee-Toxaway Project within the Maximum Elevation and Normal Minimum Elevation limits indicated in the table below. The Minimum Elevation must be implemented in accordance with the Low Inflow Protocol (LIP), required by Appendix A of this order, or the Maintenance and Emergency Protocol (MEP), required in Article 403.

Reservoir	Maximum Elevation^a (ft. local datum/ ft. above mean sea level (AMSL))	Normal Minimum Elevation (ft. local datum/ ft. AMSL)	Minimum Elevation^b (ft. local datum/ ft. AMSL)
Lake Jocassee	100.00/1110.0	86.0/1096.0	70.0/1080.0
Lake Keowee	100.00/800.0	96.0/796.0	90.0/790.0 ^c

^a Also referred to as Normal Maximum Elevation or Full Pond Elevation. This is the elevation of the reservoir corresponding to the point at which water would first begin to spill from the reservoir dam, which is the lowest point along the top of the flood gates.

^b Also referred to as Critical Reservoir Elevation. This is the elevation below which any large water intake used for public water supply, industrial water supply, or any regional power plant water supply located on the reservoir may not operate at its licensed capacity.

^c The minimum elevation of 90.0/790.0 ft AMSL for Lake Keowee becomes effective December 1, 2019, to allow time for the Oconee Nuclear Station to be modified to support operation at lower elevations at Lake Keowee. Until that time, the minimum elevation must be 94.6/794.6 ft AMSL.

The Normal Minimum Elevations outlined in the table above may be temporarily modified if required because of emergencies (operating or otherwise) beyond the control of the licensee, for short periods during annual inspections and repairs, or by operating emergencies or maintenance needs as defined in the LIP or the MEP. The licensee must notify the Commission as soon as possible, but no later than 10 days after each event, and provide the reason for the change in reservoir elevations.

Article 403. Low Inflow Protocol. Upon the effective date of this license, the licensee must implement, “The Low Inflow Protocol” (LIP) as required by Appendix A of this order and described in Appendix D of the Relicensing Agreement, filed on August 27, 2014, and attached to this license as Appendix B.

The licensee must notify the Commission as soon as possible, but no later than 10 days after implementing Stage 1 of the LIP, or after implementing each subsequent change in stage. Temporary modifications to the LIP must be made in accordance with the procedures in the LIP. For all such temporary modifications, or other conditions beyond the control of the licensee, the licensee must notify the Commission as soon as possible, but no later than 10 days after each such event, and provide the reason for the modification to the LIP.

The approved LIP must not be amended without prior Commission approval. The Commission reserves the right to make changes to the Low Inflow Protocol. Upon Commission approval, the licensee must implement any changes required by the Commission.

Article 404. Maintenance and Emergency Protocol. Upon the effective date of this license, the licensee must implement, “The Maintenance and Emergency Protocol” (MEP) included as Appendix E of the Relicensing Agreement, filed on August 27, 2014, and attached to this order as Appendix C.

The licensee must notify the Commission as soon as possible, but no later than 10 days after implementing any change in project operation required by the MEP. Temporary modifications to the MEP must be made in accordance with the procedures in the MEP. For all such temporary modifications, or other conditions beyond the control of the licensee, the licensee must notify the Commission as soon as possible, but no later than 10 days after each such event, and provide the reason for the modification to the MEP.

The approved MEP must not be amended without prior Commission Approval. The Commission reserves the right to require changes to the MEP, and upon Commission approval, the licensee must implement any changes required by the Commission.

Article 405. Reservation of Authority to Prescribe Fishways. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of such fishways as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Article 406. Recreation Management Plan. Within 90 days of the effective date

of this license, the licensee must file with the Commission for approval, a revision to the Recreation Management Plan (RMP), filed on August 27, 2014.

The revised plan must include provisions to continue to operate and maintain the existing recreation facilities at each of the following recreation sites for the term of the license: (1) at the Jocassee Development: Devils Fork State Park, Double Springs Campground, Bootleg Access Area, Grindstone Access Area, and Handpole Ridge Access Area; and (2) at the Keowee Development: Cane Creek Access Area, Crow Creek Access Area, Fall Creek Access Area, High Falls County Park, Keowee Town Access Area, Mile Creek County Park, South Cove County Park, Stamp Creek Access Area, Warpath Access Area, and World of Energy Picnic Area. The licensee must also reserve the existing Bootleg Access Area, Grindstone Access Area, and Handpole Ridge Access Area, as well as the new High Falls II Access Area and Mosquito Point Access Area for future public recreation.

The licensee must modify the RMP to include: (1) provisions to construct restrooms with lighting, expanded and lighted vehicle-with-trailer parking, courtesy dock, picnic area/shelter, single-vehicle parking, and bank fishing trail at Crow Creek Access Area; (2) provisions to construct 10 primitive campsites, 5 bank fishing stations, and 10 camping cabins at Mile Creek County Park; (3) a provision to monitor the capacity and condition of Warpath Access Area annually during the summer recreation season and develop (a) plan(s) to address capacity issues, if non-peak weekend use exceeds 90 percent of capacity, and (b) plan(s) to mitigate for overuse, if use exceeds capacity at any time; (4) a description of the existing facilities, site plans, capital and operation and maintenance costs, and schedule of any recreation facility enhancements proposed over the term of a license at World of Energy Picnic Area; (5) a provision to stabilize 6,250 feet of shoreline on islands in Lake Keowee; (6) an implementation schedule describing the anticipated year of construction for all recreation enhancement measures specified in the plan; and (7) a provision that all improvements made to project recreation sites as part of the Access Area Improvement Initiative must be identified in the Commission-approved RMP.

The Commission reserves the right to require changes to the plan. Implementation of the plan must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 407. Shoreline Management Plan. The Shoreline Management Plan (SMP) filed on August 27, 2014, is approved, with the following modification: the licensee must extend the provision in section 7.2.24 of the Shoreline Management Guidelines accepting applications for an exemption to the Maximum Size Limit for private facilities from the time of license issuance through December 31, 2020.

The licensee may make minor changes (i.e., minor alterations that are more

restrictive or necessary to meet license obligations) to the Shoreline Management Guidelines and Lake Use Restrictions to protect significant environmental resources, including newly discovered archaeological or historic sites, Threatened or Endangered Species, and Special Concern Species; and may make minor changes to Shoreline Classification Maps to correct mapping errors. The licensee must file an annual report with the Commission by December 31 each year describing any modifications made to the SMP, including the Shoreline Classification Maps. If no changes are made to the SMP or Shoreline Classification Maps, the licensee must submit a letter to that effect. If changes are made to the Shoreline Classification Maps, the report must include a description, location (latitude and longitude), and reason for each change. The Commission reserves the right to review such changes and may require changes to the SMP at any time during the term of the license.

Additionally, within 45 days of this order, the licensee must file, on CD or diskette, two separate sets of GIS data in a georeferenced electronic file format (such as ArcView shapefiles, GeoMedia files, MapInfo files, or a similar GIS format) with the Secretary of the Commission, ATTN: OEP/DHAC. The data must include a) polygon files of the surface areas of the project's reservoir(s) and tailrace(s), including separate polygons for each, and b) polyline files representing the linear extent of each shoreline management classification, by reservoir/tailrace. The data must match maps shown in the SMP. The attribute table for the polygon files must contain the name, water elevation, and elevation reference datum of each reservoir and tailrace. The attribute table for the polyline files must contain the name of each shoreline management classification and its associated reservoir/tailrace, consistent with the SMP.

All GIS data must be positionally accurate to ± 40 feet in order to comply with National Map Accuracy Standards for maps at a 1:24,000 scale. The file name(s) must include: FERC Project Number, data description, date of this order, and file extension in the following format [P-2503, reservoir name polygon/or reservoir name shoreline polyline data, MM-DD-YYYY.SHP]. The filing must be accompanied by a separate text file describing the spatial reference for the georeferenced data: map projection used (i.e., UTM, State Plane, Decimal Degrees), the map datum (i.e., North American 27, North American 83), and the units of measurement (i.e., feet, meters, miles). The text file name must include: FERC Project Number, data description, date of this order, and file extension in the following format [P-2503, project reservoir/or shoreline classification metadata, MM-DD-YYYY.TXT].

Within ten years following the effective date of the license, and every ten years thereafter for the term of the license, the licensee must file with the Commission, for approval, a revised SMP. The revised SMP must include a description of any proposed changes to the provisions and classification maps of the existing approved SMP based on an evaluation of the adequacy of the existing plan. The revised SMP must also include revised polyline data to correspond with the revised shoreline classification maps, including any necessary corrections to minor mapping errors. If changes are made to the

SMP, the filing must include both a clean copy and a red-line copy of the revised SMP so that plan modifications can be easily identified, as well as justification of such changes. In developing the revised SMP, the licensee must, at a minimum, consult with the U.S. Fish and Wildlife Service, South Carolina Department of Natural Resources, and South Carolina Department of Parks, Recreation, and Tourism to review the implementation of the SMP and recommend potential modifications. The revised SMP must include documentation of consultation with the agencies identified above and specific descriptions of how the agencies' comments are accommodated. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations prior to filing the revised SMP with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons based on project-specific reasons. The Commission reserves the right to require changes to the revised SMP.

Article 408. *Programmatic Agreement and Historic Properties Management Plan.* The licensee must implement the "Programmatic Agreement Among the Federal Energy Regulatory Commission, the North Carolina State Historic Preservation Officer, and the South Carolina State Historic Preservation Officer for Managing Historic Properties that May be Affected by Issuing a New License to Duke Energy Carolinas, LLC for the Continued Operation of the Keowee-Toxaway Hydroelectric Project in Transylvania County, North Carolina and in Pickens and Oconee Counties, South Carolina," executed on May 8, 2015, by the North Carolina State Historic Preservation Officer (SHPO) and on May 19, 2015, by the South Carolina SHPO, and including but not limited to the Historic Properties Management Plan (HPMP), filed on November 5, 2014, for the project. In the event that the Programmatic Agreement is terminated, the licensee must continue to implement the provisions of its approved HPMP. The Commission reserves the authority to require changes to the HPMP at any time during the term of the license.

Article 409. *Use and Occupancy.* (a) In accordance with the provisions of this article, the licensee must have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee must also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee must take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if

necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee must require multiple use and occupancy of facilities for access to project lands or waters. The licensee must also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee must: (1) inspect the site of the proposed construction; (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site; and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee must file with the Commission a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or

leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter with the Commission, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Commission's authorized representative, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee must consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee must determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed must not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee must take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee must not unduly restrict public access to project lands and waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project must be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article must not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee must serve copies of any Commission filing required by this order on any entity specified in the order to be consulted on matters relating to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the FPA, 16 U.S.C. § 8251 (2012), and section 385.713 of the Commission's regulations, 18 C.F.R. § 385.713 (2015). The filing of a request for rehearing does not operate as a stay of the effective date of this license, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Ann F. Miles
Director
Office of Energy Projects

Form L-10
(October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION

**TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED
MAJOR PROJECT AFFECTING THE INTERESTS OF
INTERSTATE OR FOREIGN COMMERCE**

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Article 4. The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and supervision of the Regional Engineer, Federal Energy Regulatory Commission, in the

region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall submit to said representative a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights or occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a nonpower licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project

property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the

Commission may order.

Article 11. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Commission may prescribe for the purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the Licensee

shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization

of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 22. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new

license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 23. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

APPENDIX A

Water Quality Certificate Conditions for the Keowee-Toxaway Project Issued by the South Carolina Department of Health and Environmental Control on October 29, 2015

[Commission staff has added language for clarity and ease of administration. The added text is indicated by brackets.]

Conditions of Certification:

1. Duke Energy (applicant) shall operate the Keowee-Toxaway Hydroelectric Project in accordance with the portions of the “Relicensing Agreement” [dated August 27, 2014], entered into by the applicant and members of the relicensing stakeholder team, related to the Low Inflow Protocol and Water Quality Monitoring. Specifically, the applicant shall operate the Project in accordance with Section A-2.0 Low Inflow Protocol Article and Section A-7.0 Water Quality Monitoring Article in the Relicensing Agreement.

[For ease of administration, the text of the two Articles follows:

A-2.0 LOW INFLOW PROTOCOL ARTICLE

Article – Low Inflow for the Keowee-Toxaway Hydroelectric Project

(A) The Low Inflow Protocol (LIP) for the Keowee-Toxaway Hydroelectric Project filed with the license application as Appendix D of the Relicensing Agreement is approved and incorporated into this license and the Licensee shall implement the LIP.

(B) The Licensee may modify the LIP in accordance with the procedures in the LIP. The Licensee may also make temporary modifications to the LIP to account for any changed physical conditions at the Keowee and Jocassee Developments. The Licensee shall notify the Commission of any such modifications in accordance with the LIP. Any modifications may be subject to Commission approval.

A-7.0 WATER QUALITY MONITORING ARTICLE

Article – Water Quality Monitoring

(A) During the first full month of August occurring at least 60 days following issuance of this license and during every subsequent August for the term of this

license, the Licensee shall continuously monitor dissolved oxygen concentrations in both the Keowee Hydro Station and Jocassee Pumped Storage Station tailwaters to demonstrate compliance with South Carolina's water quality certification.

(B) The Licensee shall submit the results obtained from this annual monitoring to the Commission and the South Carolina Department of Health and Environmental Control each year by November 30.]

2. The applicant must take all necessary measures during Keowee-Toxaway Hydroelectric Project operation and maintenance to prevent fuel, oil, tar, trash, debris, and other pollutants from entering the adjacent waters or wetlands.
3. Any "large water intake" owner or "major water withdrawer" applicant to Duke Energy Carolinas, LLC for a large water intake or major water withdrawal from the project must comply with the Surface Water Withdrawal, Permitting, Use And Reporting Act, S.C. Code Ann. §§ 49-4-10 et seq. A "large water intake" means any water intake (e.g., public water supply, industrial, agricultural, power plant, irrigation, etc.) having a maximum instantaneous capacity greater than or equal to one million gallons per day, and a "major water withdrawer" means a person withdrawing surface water in excess of three million gallons during any one month from a single intake or multiple intakes under common ownership within a one mile radius from any one existing or proposed intake.

The Department reserves the right to impose additional conditions on this Certification to respond to unforeseen, specific problems and to take any enforcement necessary to ensure compliance with State water quality standards.

APPENDIX B

Low Inflow Protocol

[Included in Appendix D of the Relicensing Agreement, filed on August 27, 2014]

LOW INFLOW PROTOCOL (LIP) FOR THE KEOWEE-TOXAWAY HYDROELECTRIC PROJECT

Purpose

To establish a joint management plan that Duke Energy Carolinas, LLC (Licensee); Seneca Light & Water (Seneca), Greenville Water (GW), any public water suppliers that add Large Water Intakes withdrawing water from Project Reservoirs (Jocassee and Keowee); and any public water suppliers with Large Water Intakes on the U.S. Army Corps of Engineers' (USACE) Reservoirs (Hartwell, Russell and Thurmond) that choose to participate, will follow in response to drought conditions.

Key Facts and Assumptions

1. Importance of Human Health and Safety and the Integrity of the Public Water Supply and Electric Systems – Nothing in this LIP will limit the Licensee's ability to take any and all lawful actions necessary at the Keowee-Toxaway Hydroelectric Project ("Project") to protect human health and safety, to protect its equipment from damage, to ensure the stability of the regional electric grid, to protect the equipment of the Large Water Intake owners from damage, and to ensure the stability of public water supply systems; provided that nothing in the Relicensing Agreement (RA) or LIP obligates the Licensee to take any actions to protect the equipment of Large Water Intake owners from damage or to ensure the stability of public water supply systems. It is recognized that the Licensee may provide this protection without prior consultation or notification.
2. This LIP is intended to support management of the Licensee's Reservoirs (Bad Creek, Jocassee and Keowee) in the Upper Savannah River Basin for the Licensee's operations, while meeting the water resource needs of the public.
3. As of the date of this LIP, only five entities have Large Water Intakes withdrawing water from the Project. GW and Seneca are public water suppliers. The Licensee's Large Water Intake at Oconee Nuclear Station (ONS) is used for thermal power plant cooling. The Reserve at Lake Keowee and The Cliffs Club at Keowee Vineyards, LLC each use Large Water Intakes for irrigation. The Reserve at Lake Keowee and The Cliffs Club at Keowee Vineyards, LLC have easements with clauses permitting the Licensee to require water conservation measures during droughts.
4. Any public water supplier owning a Large Water Intake that intends to locate a new intake, expand an existing intake, or rebuild an existing intake on Lake Keowee will

be required to abide by the applicable portions of this LIP, except as provided for in existing agreements (e.g., easements, leases, lake use permits or other written agreements) between the Large Water Intake owner and the Licensee.

5. Nothing in this LIP amends or replaces any other contract or agreement to which the Licensee and/or any other Large Water Intake owner is a party.
6. Revising the LIP – During the term of the New License, the Keowee-Toxaway Drought Management Advisory Group (KT-DMAG) will periodically review and recommend updates to the LIP to ensure continuous improvement of the LIP and its implementation. These evaluations and modifications will be considered at least once every ten (10) years during the New License term. Any modifications must be approved by the Licensee and all of the applicable public water suppliers with Large Water Intakes on Project Reservoirs. If such unanimous approval cannot be reached, then the dispute resolution procedures set forth in the RA will apply. Approved modifications will be incorporated through revision of the LIP, and the Licensee will file the revised LIP with the Federal Energy Regulatory Commission (FERC). If any modifications of the LIP require amendment of the New License, the Licensee will:
 - (i) provide notice to all Parties to the RA, pursuant to Section 23.0 of the RA, advising them of the New License amendment and the Licensee's intent to file it with the FERC; (ii) submit a modification request to the South Carolina Department of Health and Environmental Control (SCDHEC) for formal review and approval if required; and (iii) file a license amendment request for FERC approval if required. The filing of a revised LIP by the Licensee will not constitute or require modification of the RA, and any Party to the RA may be involved in the FERC's or SCDHEC's public processes for assessing the revised LIP, but may not oppose any part of a revised LIP that is consistent with the LIP included in the RA.
7. Transitioning to a Lower Critical Reservoir Elevation on Lake Keowee – The Licensee will operate in accordance with the provisions of the LIP, except Lake Keowee's Critical Reservoir Elevation will remain at or above 94.6 ft local datum / 794.6 ft above Mean Sea Level (AMSL) until December 1, 2019, to allow time for ONS to be modified to support its operation at lower Lake Keowee levels. The Licensee may also, in its sole discretion, decide to maintain Lake Keowee's Critical Reservoir Elevation at or above 94.6 ft local datum / 794.6 ft AMSL until both of the following are complete:
 - a. A New License that is consistent with the RA has been issued, the end of all appeals, and all rehearing and administrative challenge periods have closed; and
 - b. The Licensee, the USACE, and the Southeastern Power Administration (SEPA) have signed a New Operating Agreement (NOA) that is not inconsistent with the RA.
8. The following table provides storage volumes at various lake elevations in the Licensee's Reservoirs. Data for the Bad Creek Reservoir are from original licensing

data. Data for Lakes Jocassee and Keowee are from a 2010 bathymetric study performed by the Licensee. These data are for planning purposes and not of physical survey quality.

Reservoir	Elevations (ft local datum / ft AMSL)		Storage Increment (ac-ft)	Storage Increment (%)
	Elevation From	Elevation To		
Bad Creek	100.0 / 2310	-60.0 / 2150	30,229	7
	Total Bad Creek		30,229	
Jocassee	100.0 / 1110	86.0 / 1096	108,738	54
	86.0 / 1096	82.0 / 1092	30,000	
	82.0 / 1092	77.0 / 1087	36,687	
	77.0 / 1087	73.0 / 1083	28,730	
	73.0 / 1083	70.0 / 1080	21,233	
	Total Jocassee		225,387	
Keowee	100.0 / 800.0	96.0 / 796.0	67,636	39
	96.0 / 796.0	95.0 / 795.0	16,249	
	95.0 / 795.0	94.6 / 794.6	6,434	
	94.6 / 794.6	93.0 / 793.0	25,368	
	93.0 / 793.0	92.0 / 792.0	15,565	
	92.0 / 792.0	91.5 / 791.5	7,700	
	91.5 / 791.5	90.0 / 790.0	22,775	
	Total Keowee		161,727	
Total for Licensee’s Reservoirs			417,343	100

Definitions

1. **Critical Reservoir Elevation** – Unless otherwise defined herein, the Critical Reservoir Elevation is the level of water in a reservoir (measured by reference to local datum or in ft AMSL) below which any Large Water Intake used for public water supply, industrial water supply, or any regional power plant water supply located on the reservoir will not operate at its Licensee-approved capacity. The Critical Reservoir Elevations are:

Reservoir	Critical Reservoir Elevation (ft local datum / ft AMSL)	Type of Limit
Lake Keowee	90.0 ¹ / 790.0 ¹	Power Production
Lake Jocassee	70.0 / 1080.0	Power Production
Bad Creek	-60.0 / 2150.0	Power Production

Note 1 – This new Critical Reservoir Elevation will become effective December 1, 2019, to allow time for ONS to be modified to support its operation at lower Lake Keowee levels. See Item 7 under Key Facts and Assumptions for guidance prior to converting to this new Critical Reservoir Elevation.

2. Total Usable Storage – For the Licensee’s Reservoirs (Keowee, Jocassee, and Bad Creek), Total Usable Storage is the sum of the volume of water contained between each reservoir’s Critical Reservoir Elevation and its Full Pond Elevation, expressed in acre-feet (ac-ft). For the USACE Reservoirs in the Upper Savannah River Basin (Hartwell, Richard B. Russell, and J. Strom Thurmond), Total Usable Storage is the sum of the volume of water contained between each reservoir’s bottom-of-power-pool elevation (top of inactive pool) and the guide curve elevation denoting the top of conservation storage for any particular time of year, expressed in ac-ft.
3. Remaining Usable Storage – The sum of the volume of water contained between each reservoir’s Critical Reservoir Elevation and the actual reservoir elevation at any given point in time, expressed in ac-ft, for the Licensee’s Reservoirs. The Remaining Usable Storage calculation for the Licensee’s Reservoirs is based on a maximum drawdown elevation of 90 ft local datum / 790 ft AMSL for Lake Keowee, a maximum drawdown elevation of 70 ft local datum / 1080 ft AMSL for Lake Jocassee, and a maximum drawdown elevation of -60 ft local datum / 2150 ft AMSL for the Bad Creek Reservoir. For the USACE Reservoirs in the Upper Savannah River Basin (Hartwell, Richard B. Russell, and J. Strom Thurmond), Remaining Usable Storage is the sum of the volume of water contained between each reservoir’s bottom-of-power-pool elevation (top of inactive pool) and the actual elevation, expressed in ac-ft.
4. Storage Index – The ratio, expressed in percent, of Remaining Usable Storage to Total Usable Storage at any given point in time.
5. Large Water Intake – Any water intake (e.g., public water supply, industrial, agricultural, power plant, irrigation, etc.) having a maximum instantaneous capacity greater than or equal to one million gallons per day (MGD).

6. Keowee-Toxaway Drought Management Advisory Group (KT-DMAG) – The KT-DMAG is a voluntary advisory group to be formed and tasked with working with the Licensee when the LIP is initiated. This KT-DMAG will also meet as necessary to foster a basin-wide response to a Low Inflow Condition (see Specific Actions at Each LIP Stage). The KT-DMAG will consist of a representative from each of the following organizations that decides to form or join the KT-DMAG. By agreeing to form or join the KT-DMAG, each Member agrees to comply with all applicable requirements of this LIP. Each KT-DMAG Member may have a primary representative and an alternate representative, who may act in the absence of the primary representative.
- a. SC Department of Natural Resources (SCDNR);
 - b. SCDHEC;
 - c. US Geological Survey (USGS);
 - d. USACE;
 - e. Each owner of a Large Water Intake used for municipal, industrial, or power plant water supply located on the Project Reservoirs;
 - f. Each owner of a Large Water Intake used for municipal, industrial, or power plant water supply located on any tributary stream within the Keowee-Toxaway River Basin that ultimately drains to Lake Keowee and that agrees to coordinate its drought planning and management under the KT-DMAG;
 - g. Each owner of a Large Water Intake used for municipal, industrial, or power plant water supply located on the USACE Reservoirs that agrees to coordinate its drought planning and management under the KT-DMAG; and
 - h. Licensee (KT-DMAG Coordinator).

Members of the KT-DMAG will adopt a Charter to guide the operation of the KT-DMAG, as set forth in part below, and said Charter will require KT-DMAG Members to comply with the applicable requirements of this LIP. The KT-DMAG will meet at least annually (typically during the month of June), beginning in 2014 and continuing throughout the term of the New License, regardless of the Low Inflow Condition status, to review prior year activities, discuss data input from public water suppliers that are Large Water Intake owners, and discuss other issues relevant to the LIP. The Licensee will lead the formation of the KT-DMAG, will call meetings and set agendas, and will maintain an active roster of the KT-DMAG and update the roster as needed. The Licensee will prepare meeting summaries of all KT-DMAG meetings, make these meeting summaries available to the public by posting on its website, and notify Parties to the RA without specific responsibilities under the LIP of the availability of information on the current LIP status and possible actions.

Basic Responsibilities

Licensee's Responsibilities

The Licensee accepts the following basic responsibilities in furtherance of this LIP.

1. Monitor the following drought triggers and relevant data at least monthly or as specified for each LIP Stage.
 - Remaining Usable Storage in the Licensee's Reservoirs
 - Composite average of selected USGS streamflow gages (Twelvemile Creek near Liberty, SC (USGS Gage # 02186000); Chattooga River near Clayton, GA (USGS Gage # 02177000); French Broad River near Rosman, NC (USGS Gage # 03439000))
 - U.S. Drought Monitor for the Upper Savannah River Basin (i.e., from Thurmond Dam upstream)
 - Composite average of the Licensee's rainfall gauge readings at the Jocassee Pumped Storage Station, Keowee Hydro Station, and the Bad Creek Project
 - Oconee County USGS groundwater gage (USGS Gage # 345051083041800 OC-233) (Note: Data from other groundwater gages can be added in the future if beneficial.)
 - Remaining Usable Storage in the USACE Reservoirs downstream
 - USACE Savannah River Basin drought status
2. Coordinate KT-DMAG meetings including those noted for the particular drought stage. Provide to the KT-DMAG trigger updates, composite rainfall gauge readings, and operational and meteorological projections. Meetings can be in person, telephonic or by use of other appropriate communications. In consultation with KT-DMAG members, select and publicly communicate the LIP Stage based on the triggers established in this LIP.
3. Provide to the KT-DMAG the estimated water consumption rate by ONS (average for the current month and projections for the next month) and the estimated natural evaporation rate by reservoir from the Licensee's Reservoirs for the current month and projections for the next month.
4. Quantify total weekly flow releases (hydro generation, flood gate releases, hydro unit leakage, and dam seepage) made from the Keowee Development for the previous four weeks and provide to the KT-DMAG.
5. Coordinate with the USACE to make flow releases from Lake Keowee in accordance with the NOA between the Licensee, USACE, and SEPA regarding flow releases from the Keowee Development into the USACE's Hartwell Project and this LIP.
6. Depending on the LIP Stage, request voluntary or require mandatory water use restrictions for withdrawing water from the Licensee's Reservoirs to irrigate lakeside properties.
7. When operating in the LIP near Stage Minimum Elevations, except for flow releases required for ONS operations or situations covered by the Maintenance and

Emergency Protocol (MEP), the Licensee will not make an intentional flow release from Keowee Dam if that flow release would reduce the level of Lake Jocassee or Lake Keowee below its Stage Minimum Elevation as specified for the applicable LIP stage.

8. When operating in the LIP, the Licensee will limit weekly flow releases from the Keowee Dam to no more than the maximum weekly flow release for the applicable LIP Stage except for flow releases required for ONS operations or situations covered in the MEP. The weekly flow release amount includes the sum of all water released downstream from the Keowee Dam (i.e., hydro unit generation plus hydro unit leakage plus dam seepage plus any flood gate releases).
9. Stage Minimum Elevations are defined for each Stage of the LIP. When a subsequent Stage of the LIP is reached, the Licensee agrees both Project Reservoirs must be within 0.25 ft of the Stage Minimum Elevation of the previous Stage of the LIP before each reservoir can be lowered to the next Stage Minimum Elevation.

Responsibilities of Large Water Intake Owners that are Public Water Suppliers

Large Water Intake owners that are public water suppliers withdrawing water from the Licensee's Reservoirs agree to the following basic responsibilities in furtherance of this LIP.

1. Provide to the Licensee current month and projections for next month's water use from the Licensee's Reservoirs and from any alternative water supply sources.
2. Provide to the Licensee an overview of system conditions related to water use from the Licensee's Reservoirs (i.e., leaks, status of alternative water sources, new or potential large water users, etc.).
3. Request or require water use restrictions from water customers and/or make greater use of alternative water sources for the purpose of reducing water withdrawals from the Licensee's Reservoirs below what those withdrawals would have been otherwise, consistent with best practices and operating principles for those Large Water Intake owners' systems in accordance with the specific actions listed in this document at each LIP stage.

LIP Stage Triggers

For the purposes of this LIP, the following triggers will define the LIP Stage.

Stage 0 (Low Inflow Watch) Drought Trigger Levels

1. Storage Index in USACE Reservoirs and Storage Index in the Licensee's Reservoirs are both less than 90% (using the Critical Reservoir Elevations defined above); and
2. One of the following triggers:

- a. Twelve-week average of the area-weighted U.S. Drought Monitor for Upper Savannah River Basin (Thurmond Dam and upstream) is greater than or equal to 0; or
- b. Streamflow based on composite average of selected USGS streamflow gages (Twelvemile Creek near Liberty, SC; Chattooga River near Clayton, GA; and French Broad River near Rosman, NC) is less than 85% of long-term average for the previous four months.

Stage 1 Drought Trigger Levels

1. USACE implements Level 1 of its existing Drought Contingency Plan (DCP); and
2. One of the following triggers:
 - a. Twelve-week average of the area-weighted U.S. Drought Monitor for Upper Savannah River Basin (Thurmond Dam and upstream) is greater than or equal to 1; or
 - b. Streamflow based on composite average of selected USGS streamflow gages (Twelvemile Creek near Liberty, SC; Chattooga River near Clayton, GA; and French Broad River near Rosman, NC) is less than 75% of long-term average for the previous four months.

Stage 2 Drought Trigger Levels

1. USACE implements Level 2 of its existing DCP; and
2. One of the following triggers:
 - a. Twelve-week average of the area-weighted U.S. Drought Monitor for Upper Savannah River Basin (Thurmond Dam and upstream) is greater than or equal to 2; or
 - b. Streamflow based on composite average of selected USGS streamflow gages (Twelvemile Creek near Liberty, SC; Chattooga River near Clayton, GA; and French Broad River near Rosman, NC) is less than 65% of long-term average for the previous four months.

Stage 3 Drought Trigger Levels

1. USACE implements Level 3 of its existing DCP; and
2. One of the following triggers:
 - a. Twelve-week average of the area-weighted U.S. Drought Monitor for Upper Savannah River Basin (Thurmond Dam and upstream) is greater than or equal to 3; or
 - b. Streamflow based on composite average of selected USGS streamflow gages (Twelvemile Creek near Liberty, SC; Chattooga River near Clayton, GA; and

French Broad River near Rosman, NC) is less than 55% of long-term average for the previous four months.

Stage 4 Drought Trigger Levels

1. Storage Index in the Licensee's Reservoirs is less than 25%; and
2. One of the following triggers:
 - a. Twelve-week average of the area-weighted U.S. Drought Monitor for Upper Savannah River Basin (Thurmond Dam and upstream) is equal to 4; or
 - b. Streamflow based on composite average of selected USGS streamflow gages (Twelvemile Creek near Liberty, SC; Chattooga River near Clayton, GA; and French Broad River near Rosman, NC) is less than 40% of long-term average for the previous four months.

Specific Actions at Each LIP Stage

Stage 0

The Licensee will:

1. Notify the KT-DMAG members and the South Carolina Department of Parks, Recreation and Tourism (SCDPRT) that LIP Stage 0 has been reached;
2. Initiate drought meetings (typically monthly) among the KT-DMAG members and any other interested water system managers;
3. Provide detailed updates to the KT-DMAG on drought triggers and other relevant data, as noted in the Basic Responsibilities section;
4. Provide data to the KT-DMAG on the amount of water released from Lake Keowee for the previous four weeks;
5. Provide flow releases from Keowee Dam in accordance with the following limitations:
 - a. When the Storage Index for the Licensee's Reservoirs is below 90% but greater than or equal to 85%, limit the total maximum weekly flow release (i.e., hydro unit flow releases, flood gate flow releases, hydro unit leakage, and dam seepage) to 25,000 ac-ft (1800 cfs on a weekly average basis) or a lesser amount if required to avoid driving the level of Lake Jocassee or Lake Keowee below its Normal Minimum Elevation except flow releases required for ONS operations or situations covered by the MEP;
 - b. When the Storage Index for the Licensee's Reservoirs is below 85% but greater than or equal to 80%, limit the total maximum weekly flow release (i.e., hydro unit flow releases, flood gate flow releases, hydro unit leakage, and dam seepage) to 20,000 ac-ft (1440 cfs on a weekly average basis) or a lesser amount if required to avoid driving the level of Lake Jocassee or Lake Keowee below its Normal

Minimum Elevation except flow releases required for ONS operations or situations covered by the MEP; and

6. Provide the drought stage and other relevant information on the Licensee's lake information website and toll-free telephone system.

Large Water Intake owners that are public water suppliers will provide detailed updates to the Licensee on relevant data as noted in the Basic Responsibilities section.

Stage 1

The Licensee will:

1. Notify the FERC, KT-DMAG members and the SCDPRT that LIP Stage 1 has been reached;
2. Coordinate drought meetings (typically monthly) among the KT-DMAG members and any other interested water system managers;
3. Continue to provide detailed updates on drought triggers and other relevant data to the KT-DMAG, as noted in the Basic Responsibilities section;
4. Provide data to the KT-DMAG on the amount of water released from Lake Keowee for the previous four weeks;
5. Request those lake neighbors withdrawing water from the Licensee's Reservoirs for irrigating lakeside residential properties voluntarily limit their withdrawals to no more than two days per week, with the days to be specified by the Licensee;
6. Reduce the Minimum Elevation for Lake Keowee to 95.0 ft local datum / 795.0 ft AMSL (Stage 1 Minimum Elevation);
7. Reduce the Minimum Elevation for Lake Jocassee to 82.0 ft local datum / 1092.0 ft AMSL (Stage 1 Minimum Elevation);
8. Limit flow releases from Keowee Dam to a total maximum weekly flow release (i.e., hydro unit flow releases, flood gate flow releases, hydro unit leakage, and dam seepage) of 18,750 ac-ft (1350 cfs on a weekly average basis) or a lesser amount if required to avoid driving the level of Lake Jocassee or Lake Keowee below its Stage 1 Minimum Elevation except flow releases required for ONS operations or situations covered by the MEP; and
9. Provide the drought stage and other relevant information on the Licensee's lake information website and toll-free telephone system.

Large Water Intake owners that are public water suppliers will:

1. Notify their water customers of the Low Inflow Condition through public outreach and communication;
2. Reduce water withdrawals from Lake Keowee, as a goal, by 3-5% (or more) from the withdrawal amounts otherwise expected; and

3. Provide detailed updates on relevant data to the Licensee as noted in the Basic Responsibilities section.

Stage 2

The Licensee will:

1. Notify the FERC, KT-DMAG members and the SCDPRT that LIP Stage 2 has been reached;
2. Coordinate drought meetings (typically bi-weekly) among the KT-DMAG members and any other interested water system managers;
3. Continue to provide detailed updates on drought triggers and other relevant data to the KT-DMAG, as noted in the Basic Responsibilities section;
4. Provide data to the KT-DMAG on the amount of water released from Lake Keowee for the previous two weeks;
5. Require those lake neighbors withdrawing water from the Licensee's Reservoirs for irrigating lakeside residential properties to limit their withdrawals to no more than two days per week, with the days to be specified by the Licensee;
6. Reduce the Minimum Elevation for Lake Keowee to 93 ft local datum / 793.0 ft AMSL (Stage 2 Minimum Elevation), but no lower than the appropriate Critical Reservoir Elevation;
7. Reduce the Minimum Elevation for Lake Jocassee to 77.0 ft local datum / 1087.0 ft AMSL (Stage 2 Minimum Elevation);
8. Limit flow releases from Keowee Dam to a total maximum weekly flow release (i.e., hydro unit flow releases, flood gate flow releases, hydro unit leakage, and dam seepage) of 15,000 ac-ft (1080 cfs on a weekly average basis) or a lesser amount if required to avoid driving the level of Lake Jocassee or Lake Keowee below its Stage 2 Minimum Elevation except flow releases required for ONS operations or situations covered by the MEP; and
9. Provide the drought stage and other relevant information on the Licensee's lake information website and toll-free telephone system.

Large Water Intake owners that are public water suppliers will:

1. Notify their water customers of the Low Inflow Condition through public outreach and communication with emphasis on the need to conserve water;
2. Reduce water withdrawals from Lake Keowee, as a goal, by 5-10% (or more) from the withdrawal amounts otherwise expected; and
3. Provide detailed updates on relevant data to the Licensee as noted in the Basic Responsibilities section.

Stage 3

The Licensee will:

1. Notify the FERC, KT-DMAG members and the SCDPRT that LIP Stage 3 has been reached;
2. Coordinate drought meetings (typically bi-weekly) among the KT-DMAG members and any other interested water system managers;
3. Continue to provide detailed updates on drought triggers and other relevant data to the KT-DMAG, as noted in the Basic Responsibilities section;
4. Provide data to the KT-DMAG on the amount of water released from Lake Keowee for the previous two weeks;
5. Require those lake neighbors withdrawing water from the Licensee's Reservoirs for irrigating lakeside residential properties to limit their withdrawals to no more than one day per week, with the day to be specified by the Licensee;
6. Reduce the Minimum Elevation for Lake Keowee to 92.0 ft local datum / 792.0 ft AMSL (Stage 3 Minimum Elevation), but no lower than the appropriate Critical Reservoir Elevation;
7. Reduce the Minimum Elevation for Lake Jocassee to 73.0 ft local datum / 1083.0 ft AMSL (Stage 3 Minimum Elevation);
8. Limit flow releases from Keowee Dam to a total maximum weekly flow release (i.e., hydro unit flow releases, flood gate flow releases, hydro unit leakage, and dam seepage) of 10,000 ac-ft (720 cfs on a weekly average basis) or a lesser amount if required to avoid driving the level of Lake Jocassee or Lake Keowee below its Stage 3 Minimum Elevation except flow releases required for ONS operations or situations covered by the MEP; and
9. Provide the drought stage and other relevant information on the Licensee's lake information website and toll-free telephone system.

Large Water Intake owners that are public water suppliers will:

1. Notify their water customers of the Low Inflow Condition through public outreach and communication with increased emphasis on the need to conserve water;
2. Reduce water withdrawals from Lake Keowee, as a goal, by 10-20% (or more) from the withdrawal amounts otherwise expected; and
3. Provide detailed updates on relevant data to the Licensee as noted in the Basic Responsibilities section.

Stage 4

The Licensee will:

1. Notify the FERC, KT-DMAG members and the SCDPRT that LIP Stage 4 has been reached;
2. Coordinate bi-weekly (or more frequently if needed) drought meetings among KT-DMAG members and any other interested water system managers;
3. Continue to provide detailed updates on drought triggers and other relevant data to the KT-DMAG, as noted in the Basic Responsibilities section;
4. Provide data to the KT-DMAG on the amount of water released from Lake Keowee for the previous two weeks;
5. Require those lake neighbors withdrawing water from the Licensee's Reservoirs for irrigating lakeside residential properties to cease all such withdrawals;
6. Reduce the Minimum Elevation for Lake Keowee to 90.0 ft local datum / 790.0 ft AMSL (Stage 4 Minimum Elevation), but no lower than the appropriate Critical Reservoir Elevation;
7. Reduce the Minimum Elevation for Lake Jocassee to 70.0 ft local datum / 1080.0 ft AMSL (Stage 4 Minimum Elevation);
8. Limit flow releases from Keowee Dam to the following:
 - a. When the Storage Index for the Licensee's Reservoirs is below 25% but greater than 12%, except for flow releases required by the FERC, for ONS operations, or situations covered by the MEP, limit the total maximum weekly flow release (i.e., hydro unit flow releases, flood gate flow releases, hydro unit leakage, and dam seepage) to 7,500 ac-ft (540 cfs on a weekly average basis) or a lesser amount if required to avoid driving the level of Lake Jocassee below its Stage 4 Minimum Elevation and to maintain the level of Lake Keowee at or above 91.5 ft local datum / 791.5 ft AMSL or its Critical Reservoir Elevation, whichever is higher;
 - b. When the Storage Index for the Licensee's Reservoirs is at or below 12%, cease making hydro unit and floodgate flow releases, except for flow releases required by the FERC, for ONS operations, or situations covered by the MEP.
9. Provide the drought stage and other relevant information on the Licensee's lake information website and toll-free telephone system.

Large Water Intake owners that are public water suppliers will:

1. Notify their water customers of the Low Inflow Condition through public outreach and communication with increased emphasis on the need to conserve water;
2. Reduce water withdrawals from Lake Keowee by 20-30% (or more) from the withdrawal amounts otherwise expected; and

3. Provide detailed updates on relevant data to the Licensee as noted in the Basic Responsibilities section.

Recovery from LIP Stages

Recovery under this LIP as conditions improve will be accomplished by reversing the staged approach outlined above, except the only trigger to recover from a stage is for either the storage index for the Licensee's Reservoirs or the USACE drought trigger to be exceeded for the current stage as described below. The following table provides the storage levels required for recovery from a higher numbered "Stage Y" to a lower numbered "Stage X":

Recovery from Stage Y to Stage X	Required Storage
From Stage 4 to Stage 3	Storage Index for the Licensee's Reservoirs is greater than or equal to 25%
From Stage 3 to Stage 2	Storage for the USACE Reservoirs recovers to amount for initial implementation ¹ of Level 2 of its DCP
From Stage 2 to Stage 1	Storage for the USACE Reservoirs recovers to amount for initial implementation ¹ of Level 1 of its DCP
From Stage 1 to Stage 0	Storage for the USACE Reservoirs returns to amount required for Normal operations ¹
From Stage 0 to Normal	Storage Index for the Licensee's Reservoirs is greater than or equal to 90%

Note 1 – These are USACE storage amounts that indicate when the USACE increases its drought level (Normal to 1, 1 to 2 or 2 to 3) which is not the same storage amount that indicates when USACE decreases its drought level (3 to 2, 2 to 1 or 1 to Normal). The USACE requires greater storage amounts when recovering from drought (decreasing drought levels).

APPENDIX C

Maintenance and Emergency Protocol

[Included in Appendix E of the Relicensing Agreement, filed on August 27, 2014]

MAINTENANCE AND EMERGENCY PROTOCOL (MEP) FOR THE KEOWEE-TOXAWAY HYDROELECTRIC PROJECT

Introduction

Under some emergency, equipment failure, power plant maintenance, and other situations, certain license conditions may be impractical or even impossible to meet and may need to be suspended or modified temporarily to avoid taking unnecessary risks. The objectives of this protocol are to define the most likely situations of this type, identify the potentially impacted license conditions, and outline the general approach the Licensee will take to mitigate the impacts to license conditions and to communicate with the resource agencies and affected parties.

Note: Due to the potential variability of these situations, this protocol is not intended to give an exact step-by-step solution for all situations. It does, however, provide basic expectations for the Licensee's approach to dealing with such situations. Specific details will vary and will be determined on a case-by-case basis as the protocol is implemented.

The Licensee will review the requirements of this protocol each time it is used and may revise the MEP from time to time as noted below.

Key Facts and Definitions

1. Human Health and Safety and the Integrity of the Public Water Supply and Electric Systems – Nothing in this protocol will limit the Licensee's ability to take any and all lawful actions necessary at the Keowee-Toxaway Hydroelectric Project (Project) to protect human health and safety, to protect its equipment from damage, to ensure the stability of the regional electric grid, to protect the equipment of the Large Water Intake owners from damage, and to ensure the stability of public water supply systems; provided that nothing in the Relicensing Agreement ("RA") or MEP obligates the Licensee to take any actions to protect the equipment of Large Water Intake owners from damage or to ensure the stability of public water supply systems. It is recognized the Licensee may provide this protection without prior consultation or notification.
2. Normal Full Pond Elevation – Also referred to simply as "full pond," this is the level of a reservoir corresponding to the point at which water would first begin to spill from the reservoir's dam(s) if the Licensee took no action. This level corresponds to the lowest point along the top of the floodgates for Project Reservoirs (i.e., Lake

Jocassee and Lake Keowee). To avoid confusion among the many reservoirs the Licensee operates, it has adopted the practice of referring to the Full Pond Elevation for all of its reservoirs as equal to 100.0 ft relative to local datum. The Full Pond Elevations for the Project Reservoirs are:

Reservoir	Full Pond Elevation	
	Local Datum (ft)	Above Mean Sea Level (ft AMSL)
Lake Jocassee	100.0	1110.0
Lake Keowee	100.0	800.0

3. Normal Minimum Elevation – The level of a reservoir (measured in ft AMSL, or feet relative to the full pond contour with 100.0 ft corresponding to full pond) that defines the bottom of the reservoir’s Normal Operating Range for a given day of the year. If inflows and outflows to the reservoir are kept within some reasonable range of the average or expected amounts, hydroelectric project equipment is operating properly, and neither the Low Inflow Protocol (LIP) nor MEP has been implemented, reservoir level excursions below the Normal Minimum Elevation should not occur.
4. Normal Maximum Elevation – The level of a reservoir (measured in ft AMSL, or feet relative to the full pond contour with 100.0 ft corresponding to full pond) that defines the top of the reservoir’s Normal Operating Range for a given day of the year. If inflows and outflows to the reservoir are kept within some reasonable range of the average or expected amounts, hydroelectric project equipment is operating properly, and neither the LIP nor MEP has been implemented, reservoir level excursions above the Normal Maximum Elevation should not occur.
5. Normal Operating Range – The band of reservoir levels within which the Licensee normally attempts to maintain a given reservoir on a given day. Each Project Reservoir has its own specific Normal Operating Range bounded by a Normal Maximum Elevation and a Normal Minimum Elevation. If inflows and outflows to the reservoir are kept within some reasonable range of the average or expected amounts, hydroelectric project equipment is operating properly and neither the LIP nor MEP has been implemented, reservoir level excursions outside of the Normal Operating Range should not occur. The New License for the Project includes the Normal Operating Ranges for the Project Reservoirs (i.e., Normal Minimum, Normal Maximum) as listed in the proposed Reservoir Elevations License Article and as follows.

Reservoir	Normal Maximum Elevation (ft local datum / ft AMSL)	Normal Minimum Elevation (ft local datum / ft AMSL)
Lake Jocassee	100.0 / 1110.0	86.0 / 1096.0
Lake Keowee	100.0 / 800.0	96.0 / 796.0

6. Returning to Normal – Some of the situations noted in this MEP can impact the Licensee’s ability to operate the Project in the most efficient and safest manner for power production. The Licensee will therefore endeavor in good faith to repair existing Project equipment and facilities and return them to service within a reasonable period of time, commensurate with the severity of the equipment / facility repair requirements. If the Licensee decides that repair is not cost-effective or that hydro station or dam retirement is necessary, the Licensee will notify the Parties to the RA, pursuant to Section 23.0 of the RA and consult with them as well as with the Federal Energy Regulatory Commission (FERC) to determine any necessary modifications of the New License and / or the RA.
7. Incidental Maintenance – This is a maintenance activity at the Project works that is very brief in nature or that requires minimal if any deviation from normal license conditions and that does not require deviation from any license conditions related to prescribed flow releases from Project structures, or the Normal Operating Ranges for reservoir levels, or that is less than 72 hours in duration and will not require any excursions below any applicable Critical Reservoir Elevations. Except for the notification steps identified in the tables below for communication with resource agencies and affected parties for conditions that impact prescribed flow releases, Incidental Maintenance is exempt from the requirements of this protocol.
8. Notification Guidance
 - a. Scheduled Maintenance that Affects License Conditions – Typically, scheduled maintenance is planned in advance. Once a likely maintenance schedule has been established, the Licensee will endeavor in good faith to provide as much advance notice as possible to the affected parties identified in this protocol.
 - b. Unscheduled Maintenance and Emergencies that Affect License Conditions – It is not possible for the Licensee to assure any level of advance notice. For these situations, the Licensee will endeavor in good faith to inform the affected parties identified in this protocol within some reasonable amount of time after the situation has been identified.
9. Relationship Between this MEP and the LIP – The LIP provides for reductions in Project water use and modification of the Normal Operating Ranges for reservoir levels when water demands on Project Reservoirs substantially exceed net inflow. Lowered reservoir levels caused by situations addressed under this MEP will not

invoke implementation of the LIP. Also, if the LIP has already been implemented at the time this MEP is initiated, the Licensee will typically suspend its implementation of the LIP requirements until the MEP situation has been eliminated. The Licensee may however choose to continue with the LIP.

10. Peak Recreation Period – The period when recreation use on Project Reservoirs is generally at the highest levels (i.e., April 1 through September 30).
11. Critical Reservoir Elevation – Unless otherwise defined herein, the Critical Reservoir Elevation is the level of water in a reservoir (measured by reference to local datum or in ft AMSL) below which any Large Water Intake used for public water supply, industrial water supply, or any regional power plant water supply located on the reservoir will not operate at its Licensee-approved capacity. The Critical Reservoir Elevations are as follows.

Reservoir	Critical Reservoir Elevation (ft local datum / ft AMSL)	Type of Limit
Lake Jocassee	70.0 / 1080.0	Power Production
Lake Keowee	90.0 ¹ / 790.0 ¹	Power Production

Note 1 - This new Critical Reservoir Elevation of 90.0 / 790.0 will become effective December 1, 2019 to allow time for ONS to be modified to support its operation at lower Lake Keowee levels. See Item 12 below for guidance prior to converting to this new Critical Reservoir Elevation.

12. Transitioning to a Lower Critical Reservoir Elevation on Lake Keowee – The Licensee will operate in accordance with the provisions of the MEP, except Lake Keowee's Critical Reservoir Elevation will remain at or above 94.6 ft local datum / 794.6 ft AMSL until December 1, 2019, to allow time for ONS to be modified to support its operation at lower Lake Keowee levels. The Licensee may also, in its sole discretion, decide to maintain Lake Keowee's Critical Reservoir Elevation at or above 94.6 ft local datum / 794.6 ft AMSL until both of the following are complete:
- A New License that is consistent with the RA has been issued, the end of all appeals, and all rehearing and administrative challenge periods have closed; and
 - The Licensee, the United States Army Corps of Engineers, and the Southeastern Power Administration have signed a New Operating Agreement (NOA) that is not inconsistent with the RA.
13. Abbreviations for Organizational Contacts – Greenville Water (GW); North Carolina State Historic Preservation Office (NCSHPO); Seneca Light and Water (Seneca); South Carolina Department of Natural Resources (SCDNR); South Carolina Department of Health and Environmental Control (SCDHEC); South Carolina State Historic Preservation Office (SCSHPO); United States Fish and Wildlife Service

(USFWS); the Eastern Band of Cherokee Indians (EBCI); US Army Corps of Engineers - Savannah District (USACE); South Carolina Department of Parks, Recreation and Tourism (SCDPRT); Friends of Lake Keowee Society (FOLKS), Advocates for Quality Development (AQD), and Mountain Lakes Community Association (MLCA).

14. Voltage and Capacity Emergencies – The electric transmission system serving the Project area is part of the Licensee's main transmission system. The Licensee's system is connected to other large transmission systems located in the southeast. If the Licensee's system reliability is at risk due to Voltage and Capacity Emergencies, the ability to provide secure and continuous electric service to the Licensee's electric customers becomes compromised. The Licensee continuously monitors the electric transmission system. Therefore, for the purposes of this protocol, a Voltage or Capacity Emergency shall exist when declared by the Licensee.
15. Large Water Intake – Any water intake (e.g., public water supply, industrial, agricultural, power plant, irrigation, etc.) having a maximum instantaneous capacity greater than or equal to one million gallons per day (MGD).
16. Preparation for High Inflow Events – With modern forecasting, it is possible to forecast many high inflow events days in advance and to increase hydro generation hours to lower reservoir levels to reduce the potential for spilling and high water. This type of advance action is typically taken from one to five days or more before the expected arrival of the storm. The Normal Operating Ranges of reservoir levels may not allow for this type of reservoir level reduction under anticipated heavy inflow circumstances, and therefore, allowances are made in this MEP to lower reservoir levels below the Normal Minimum Elevations if needed in preparation for such events.
17. Revising the MEP – The Licensee will review the requirements of this MEP each time it is used and will consult with the organizations listed in Item 13 above if the Licensee determines modifications are warranted. If the MEP is modified, the Licensee will inform the Parties to the RA. If any modifications of the MEP require amendment of the New License, the Licensee will: (i) provide notice to all Parties to the RA, pursuant to Section 23.0 of the RA, advising them of the proposed New License amendment and the Licensee's intent to file it with the FERC; (ii) request the SCDHEC formally review and approve modification of the 401 WQC if required; and (iii) file a license amendment request for FERC approval if required. The filing of a revised MEP by the Licensee will not by itself constitute or require modification of the RA, and any Party to the RA may be involved in the FERC's or SCDHEC's public processes for assessing the revised MEP, but may not oppose any part of a revised MEP that is consistent with the MEP included in the RA.

Guidance for Responding to MEP Conditions

This section provides guidance for responding to the most likely MEP conditions (see Table 1 below) when this protocol will be enacted. Required flow releases and normal reservoir operating ranges are the license requirements most likely to be affected by MEP conditions.

Table 1: Conditions and Potential Impacts to License Requirements

Condition	Condition Name	Indications
MEP1	Hydro Unit Maintenance	Maintenance will require hydro unit shutdown
MEP2	Dam Safety Emergency	Condition A or B per the Emergency Action Plan (EAP) (i.e., dam failure has occurred, is imminent or a potentially hazardous situation exists) or some other dam safety concern is identified
MEP3	Voltage or Capacity Emergency	Voltage or capacity conditions on the electric grid in the Licensee's system or the larger regional electric grid cause the Licensee's system reliability and safety to be at risk and a voltage or capacity emergency is declared by the Licensee
MEP4	Reservoir Drawdown Below Normal Minimum Elevation due to maintenance, emergency or other reasons (not due to low or high inflow)	The reservoir level is below Normal Minimum Elevation
MEP5	Expected or existing high inflow event	The water level at a reservoir is or is projected to be significantly above or below the Normal Operating Range

Communication with Resource Agencies and Affected Parties

The Licensee will implement the appropriate communications based on the potential license requirements affected by the MEP condition. Communications include the following:

- Notification – The Licensee notifies the organization of the MEP event and the Licensee's planned actions; and

- Consultation – The Licensee notifies the organization of the MEP event and the Licensee's planned actions. The Licensee also requests input from the consulting organizations about options and alternatives to lessen the environmental, cultural, and human impacts of the MEP condition.

Generally, for unplanned and unscheduled MEP conditions, notifications occur as conditions unfold and will be followed by consultation.

Condition MEP1.1 – Scheduled Hydro Unit Maintenance**Mitigating Actions**

1. **Scheduling** – To the extent practical, the Licensee will avoid scheduling hydro unit maintenance requiring drawdowns of the Project Reservoirs below the Normal Minimum Elevation during the period April 1 to May 15 to protect black bass spawning and to avoid hindering the Licensee’s ability to provide recreation access during the Peak Recreation Period as defined above.
2. **Drawing Down the Affected Reservoir** –To minimize the impacts to its electric customers, the Licensee may choose to draw down a reservoir using its hydro units to minimize spillage from the dam during maintenance operations. The Licensee may draw down reservoir levels below the Normal Minimum Elevations, but not to levels below the applicable Critical Reservoir Elevations, unless such deeper drawdown is essential for access or safety.

Communication with Resource Agencies and Affected Parties

Condition MEP1.1 – Scheduled Hydro Unit Maintenance		
Notification	Consultation	Comments
FERC	AQD FOLKS Large Water Intake owners SCDHEC SCDNR SCDPRT USACE USFWS	If the maintenance will affect any Normal Operating Range for Project Reservoir levels, provide notification and initiate consultation when maintenance schedules are determined, but at least 30 days prior to beginning any reservoir drawdown or the hydro unit maintenance.
	NCSHPO ¹ SCSHPO EBCI	Consult no less than 30 days prior to the planned activity if required by the Historic Properties Management Plan.
AQD FOLKS MLCA Project Access Area Lessees ²		The Licensee will implement notification procedures for any temporary closures of recreation facility/access areas (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.

Condition MEP1.1 – Scheduled Hydro Unit Maintenance		
Notification	Consultation	Comments
General Public		When the Licensee determines the response to a MEP condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and its reservoir level toll-free phone system plus implement other appropriate measures to inform the general public.

Note 1 - If Lake Jocassee is the reservoir being drawn down

Note 2 - If affected by the maintenance

Condition MEP1.2 – Unscheduled Hydro Unit Maintenance**Mitigating Actions**

1. **Drawing Down the Affected Reservoir** –To minimize the impacts to its electric customers, the Licensee may choose to draw down a reservoir using its hydro units to minimize spillage from the dam during maintenance operations. The Licensee may draw down reservoir levels below the Normal Minimum Elevations, but not to levels below the applicable Critical Reservoir Elevations, unless such deeper drawdown is essential for access or safety.

Communication with Resource Agencies and Affected Parties

Condition MEP1.2 – Unscheduled Hydro Unit Maintenance		
Notification	Consultation	Comments
FERC AQD FOLKS Large Water Intake owners MLCA SCDHEC SCDNR SCDPRT USACE USFWS	AQD FOLKS Large Water Intake owners SCDHEC SCDNR SCDPRT USACE USFWS	If the maintenance will affect any Normal Operating Range for Project Reservoir levels, perform notification promptly after the unscheduled maintenance begins, but no longer than 10 days afterwards. Initiate consultation within 10 days.
NCSHPO ¹ SCSHPO EBCI	NCSHPO ¹ SCSHPO EBCI	Consult if required by the Historic Properties Management Plan.
AQD FOLKS MLCA Project Access Area Lessees ²		The Licensee will implement notification procedures for any temporary closures of recreation facility/access areas (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.

Condition MEP1.2 – Unscheduled Hydro Unit Maintenance		
Notification	Consultation	Comments
General Public		When the Licensee determines the response to a MEP condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and its reservoir level toll-free phone system and implement other appropriate measures to inform the general public.

Note 1 - If Lake Jocassee is the reservoir being drawn down

Note 2 - If affected by the maintenance

Condition MEP2 – Dam Safety Emergency**Mitigating Actions**

1. **Safety Must Come First** – If a Condition A or B is declared per the Licensee’s EAP, or if other dam safety concerns arise, the Licensee may modify or suspend any license conditions immediately and for as long as necessary to restore the dam to a safe condition.

Communication with Resource Agencies and Affected Parties

Condition MEP2 – Dam Safety Emergency	
Timing of Communication	Comments
During EAP Condition A or B	Conducted strictly in accordance with the Licensee’s EAP. In cases where dam safety concerns arise that are not a Condition A or B per the Licensee’s EAP, consultation with resource agencies and affected parties will occur as soon as practical after the dam safety concern arises.
Once Dam Safety Conditions Have Stabilized	When the Licensee determines the response to a MEP condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and its reservoir level toll-free telephone system to inform the general public.
Access Area Closure Notification	The Licensee will implement notification procedures for any temporary closures of recreation facility/access areas (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.

Condition MEP3 – Voltage and Capacity Emergencies**Mitigating Actions**

1. **Suspension of the Normal Operating Ranges for Reservoir Levels** – If a voltage or capacity emergency (as defined above) occurs, the Licensee may modify or suspend reservoir level operating limitations immediately and for as long as necessary, if doing so would allow additional hydro station operation needed to restore the electric grid to a stable condition. Reservoir levels will not be reduced below the applicable Critical Reservoir Elevations.

Communication with Resource Agencies and Affected Parties

Condition MEP3 – Voltage and Capacity Emergencies		
Notification	Consultation	Comments
FERC SCDNR SCDHEC SCDPRT USFWS USACE Large Water Intake owners	Large Water Intake owners SCDHEC SCDNR SCDPRT USACE USFWS	Perform notification as soon as practical, but no longer than 10 days following the deviation from a license condition for Voltage or Capacity Emergency reasons. Initiate consultation as soon as practical.
NCSHPO ¹ SCSHPO EBCI	NCSHPO ¹ SCSHPO EBCI	Consult if required by the Historic Properties Management Plan.
AQD FOLKS MLCA Project Access Area Lessees ²		The Licensee will implement notification procedures for any temporary closures of recreation facility/access areas (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.
General Public		When the Licensee determines the response to a MEP condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and its reservoir level toll-free telephone system plus implement other appropriate measure to inform the general public.

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Note 1 - If Lake Jocassee is the reservoir being drawn down

Note 2 - If affected by the maintenance

Condition MEP4.1 – Reservoir Drawdown (Planned)**Mitigating Actions**

1. **Scheduling** – To the extent practical, the Licensee will avoid scheduling drawdowns of the Project Reservoirs below the Normal Minimum Elevations during the period from April 1 to May 15 to protect black bass spawning and to avoid hindering the Licensee's ability to provide recreation access during the Peak Recreation Period as defined above.
2. **Avoid Falling Below Critical Reservoir Elevations** – To the extent practical, the Licensee will avoid falling below the applicable Critical Reservoir Elevations as noted above.

Communication with Resource Agencies and Affected Parties

Condition MEP4.1 – Reservoir Drawdown (Planned)		
Notification	Consultation	Comments
FERC AQD FOLKS Large Water Intake owners SCDHEC SCDNR SCDPRT USACE USFWS	Large Water Intake owners SCDHEC SCDNR SCDPRT USACE USFWS	Provide notification and consult when approximate drawdown dates are determined, but at least 30 days prior to beginning drawdown.
	NCSHPO ¹ SCSHPO EBCI	Consult no less than 30 days prior to the planned activity if required by the Historic Properties Management Plan.
MLCA Project Access Area Lessees ²		The Licensee will implement notification procedures for any temporary closures of recreation facility/access areas (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.

Condition MEP4.1 – Reservoir Drawdown (Planned)		
Notification	Consultation	Comments
General Public		When the Licensee determines the response to a MEP condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and its reservoir level toll-free telephone system implement other appropriate measures to inform the general public.

Note 1 - If Lake Jocassee is the reservoir being drawn down

Note 2 - If affected by the maintenance

Condition MEP4.2 – Reservoir Drawdown (Unplanned)Mitigating Actions

1. Avoid Falling Below Critical Reservoir Elevations – To the extent practical, the Licensee will avoid falling below the applicable Critical Reservoir Elevations as noted above.

Communication with Resource Agencies and Affected Parties

Condition MEP4.2 – Reservoir Drawdown (Unplanned)		
Notification	Consultation	Comments
FERC AQD FOLKS Large Water Intake owners SCDHEC SCDNR SCDPRT USACE USFWS	Large Water Intake owners SCDHEC SCDNR SCDPRT USACE USFWS	Perform notification as soon as practical, but no longer than 10 days after the drawdown begins. Begin consultation within 10 days after the drawdown begins.
NCSHPO ¹ SCSHPO EBCI	NCSHPO ¹ SCSHPO EBCI	Consult if required by the Historic Properties Management Plan.
MLCA Project Access Area Lessees ²		The Licensee will implement notification procedures for any temporary closures of recreation facility/access areas (e.g., closure due to extended low reservoir levels) in accordance with the Recreation Management Plan.
General Public		When the Licensee determines the response to a MEP condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and its reservoir level toll-free telephone system and to implement other appropriate measures to inform the general public.

Note 1 - If Lake Jocassee is the reservoir being drawn down

Note 2 - If affected by the maintenance drawdown

Condition MEP5 – Expected or Existing High Inflow Event**Mitigating Actions**

1. As outlined in the Key Facts and Definitions section of this protocol, in preparation for high inflow events and to minimize the potential for unplanned spillage the Licensee may reduce reservoir levels below the Normal Minimum Elevation, but not below the applicable Critical Reservoir Elevations. Reservoir levels may also rise significantly above Normal Maximum Elevations as a result of high inflow events. The reservoir levels may be below Normal Minimum Elevations or above Normal Maximum Elevations for as long as necessary to minimize the effects of the high inflow event on the Project Reservoirs and downstream reservoirs and to manage reservoir elevations during high inflow events.

Communication with Resource Agencies and Affected Parties

Condition MEP5 – Expected or Existing High Inflow Event	
Notification	Comments
FERC SCDHEC SCDNR SCDPRT USACE USFWS	The Licensee will perform notification as soon as practical following or prior to a deviation from license requirements for an existing or expected high inflow event.
AQD FOLKS MLCA Project Access Area Lessees	The Licensee will implement notification procedures for any temporary closures of recreation facility/access areas (e.g., closure due to extended low or high reservoir levels) in accordance with the Recreation Management Plan.
General Public	When the Licensee determines the response to a MEP condition will potentially impact license conditions, the Licensee will add appropriate messages to its public information Web site and its reservoir level toll-free phone system plus implement other appropriate measure to inform the general public.

Document Content(s)

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